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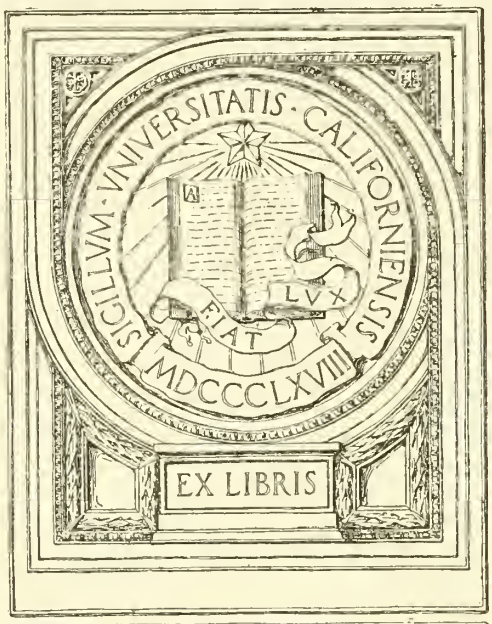

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ORIGINAL ARTICLES

THE MEASURE OF MENTALITY*

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St. Paul, Minn.

The revelations of the psychological tests of the army are surprising and bewildering. It is somewhat of a shock to realize that the average of human intelligence in this country is that of a child of about twelve years of age. We have been accustomed to boast of the high grade of our citizenship, of the intelligence of the American workman, of the superior type of our rural manhood, and of the easy adaptability of the city dweller to the requirements of our modern civilization. We have taken no little pride in the fact that the little red schoolhouse has educated our youth to a degree surpassing that attained in the older countries, and that our free institutions have produced a type of manhood superior to that of other less favorably nurtured peoples. It is, therefore, a startling statement that the psychological tests, applied to a group of stalwart men, men between the ages of twenty-one and thirty-one, shows them to be intellectually juvenile rather than adult. These tests applied to over a million and a half recruits, coming from all parts of the country, representing all grades of society, all conditions of life, whether rural or urban, educated or illiterate, rich or poor, provide a fair basis on which to estimate the general intelligence of our citizens. Everyone within the limits of the draft ages was subjected to the tests. The recruits examined represented a cross section of the manhood of this country, after the draft boards had eliminated those who were physically unfit for service. Those who were sick, crippled, manifestly imbecile, insane, criminal or socially inadequate, have been excluded from the tests. It may, therefore, be said that the group examined was composed of the more than average citizen, and was representative of more or less selected physical and mental excellence.

Heretofore our conceptions of human intelligence have been based upon a general opinion that some few of our people are idiots, imbeciles or insane, and that the rest are intelligent. We believed that the main difference between people were those produced by conditions of environment or by education, and we believed that any person subjected to good social conditions and properly trained could with ease improve the quality of his intelligence. We were rather inclined to mistake learning for intelligence, and to believe that one who could acquire the former would acquire the latter. In a general sense, any one who managed to get through life without attracting attention by the inferiority or excellence of his reactions to his surroundings, was normal and average in his intelligence. We have never previously been able to determine and define in a practical way the degree of intelligence possessed by any one except on the basis of his past performance. If after trial he succeeded, he was regarded as of superior intelligence, and if he failed, he was set down as of inferior intelligence. Heretofore laboratory tests of a psychological nature, while demonstrating the reaction of an individual to some particular form of sensory stimulation, have failed to measure mind as a whole, or to give results of a practical nature.

TESTING THREE MILLION

How was this startling conclusion reached? What standards of intelligence served as the basis of grading? What were the tests used, and how were they applied? The story of the intelligence tests of the recruits is an interesting and instructive one. It had its beginning in the sudden necessity of fitting the 3,000,000 American soldiers for the important work be-

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fore them, in the shortest space of time and with the greatest possible efficiency. From this mass of men, gathered from all walks of life, with different education and training, officers had to be chosen, engineering regiments selected, artillery men trained, the fighting men grouped together, service organizations developed, to meet an emergency which allowed of no prolonged method of selection by observation, or trial through experience. Never was a greater task imposed upon this country than to build a highly specialized army out of a horde of men with undetermined ability, of varying degrees of education, and of unknown intelligence. Hitherto there had been no known method of determining the capacity of a group of men for special work except by the slow process of letting them try what they could do, and eliminating those who were incapable or inefficient. If this plan had been used we could never have placed our troops in France in time to assist in the German defeat. The qualities that are required in making an artillery man are not those needed for infantry, and the men fit for pioneer battalions would be worse than useless if assigned to a machine gun company. Besides a perfect physical make up, our soldiers needed intelligence adapted to the special service they were to perform. A new and rapid method of determining the natural intellectual capacity of our soldier was urgently needed.

The physical examination of recruits weeded out those who were subject to disease conditions or who were anatomically imperfect. Those physically fit were sent into the line, those suffering from remediable conditions were sent to development battalions to recover from their temporary disability, and men who lacked soldierly qualities were sent to service organizations for manual labor and similar duties.

Every recruit was graded according to his trade or occupation. If he claimed to be an apprentice, journeyman, or expert in his trade, he was put through an oral examination and a performance test which demonstrated his claim was valid, and he was so rated upon his personnel card. The physical inspection was followed by a psychological examination, which gave a fairly reliable measurement of his intellectual endowment. By the combination of physical inspection, performance test and psychological examination, every soldier was rated as to his value to the army in the various positions he was fitted to fill. The information thus acquired as to the natural intellectual endowment, the nature and extent of his occupational training, and his freedom from physical defect, enabled the officers accurately to pick out those who were good fighting material, those who belonged in artillery regiments, those who were fit for non-commissioned officers, and those who were fit in service organizations to work with the pick and shovel. If five hundred electrical workers were wanted immediately in France, a glance at the rating cards in the personnel office at once gave the names with qualifications of as many electricians. By this very practical and wonderfully developed system, the horde of recruits was sorted out into an orderly and efficient army, whose efficiency has challenged the admiration of the world.

One of the chief requisites was to get an intelligent army, that had qualities of initiative, of capacity to entertain ideals, to realize the high purposes for which we were fighting, with an appreciation of the necessity of obedience and soldierly qualities. To the work of Binet we are indebted for the standards of intellectual growth and development, and these tests were modified to meet the requirements of the army. A Committee of the American Psychological Association was asked to arrange a series of practical tests, which were given a preliminary trial on several thousand recruits, and were then adopted as material for testing the soldiers in all the cantonments. The tests were such as could be applied to groups of two or three hundred, and were of a character that could be readily understood.

THE TESTS

The tests by which intelligence is measured in the cantonments are very simple and effective. Every soldier in the army was graded according to his natural intellectual endowment. Obviously this examination must be done upon large groups, as it would be impossible to individually examine a million and a half men in the time at our disposal. In each cantonment was a chief psychologist, with a highly trained staff, and with the necessary equipment rapidly and accurately to perform

the work. The men were examined in groups of from one hundred to three hundred. They assembled in a large room, and were first given the "Alpha" test. This consists of eight pages of printed diagrams, arithmetical problems, questions on general information, inverted sentences and other simple but shrewdly planned tests to determine the perceptive powers, memory, power of fixed attention, judgment and inhibition of the recruit. The psychologist explained in simple terms what the candidate was expected to do, and at a given signal the soldier began to answer the problems on the first page. At the expiration of a few minutes, the command "Attention" was given, and the pencil was raised in the air and held there until the second page of the problems was explained, when the word "Go" was given. In this manner, under a time limit, the problems on the eight pages were answered as fully and as well as the soldier's mental machinery would permit. The test takes forty-five minutes. The papers were than marked with the aid of a transparent stencil upon which were printed the correct answers to the problems, so that the examiners could see errors at a glance and check them. The system employed assured rapid and accurate work, and each recruit was given an intellectual grade corresponding with the character of his work. The system of examination eliminated the personal equation very completely, and assured fairness as well as accuracy in marking.

The Alpha test is not difficult. It comprises problems of the most simple nature, easily comprehended by any person who can read and write. In the experience of the examiners, higher marks have frequently been earned by many men who have gone through the fourth grade of school than by others who have had high school and college training. The tests do not particularly concern information acquired in the process of education, but solely the natural endowment of the man as manifested by the quickness and accuracy of his perceptive processes, the power of his mind to retain impressions, his capacity for fixed attention and logical deduction. In this respect it is not a test that depends in any degree upon educational or social conditions.

For those who could not read or write, as well as for foreigners, who are handicapped by language difficulty, another test designated as the Beta test was provided. This also consists of eight printed pages of problems, almost entirely pictorial or diagramatic in character. One page consists of mazes through which the recruit was to thread his way with a pencil; another page required him to supply missing parts in the pictures of animals and objects. These tests are not more simple than those in Alpha, but are more easily comprehended because they are pictorial. When a recruit made a poor score in the Alpha test, he was given the Beta test to ascertain whether he is handicapped by the printed or spoken word. Occasionally a man who has scored rather poorly in the Alpha will raise his marking in the Beta test, but usually failure in Alpha is also followed by failure in the Beta test.

When the recruit failed in the Beta test he was given an individual Binet test. This is an oral test, in which questions are asked and answers required. These tests have been carefully worked out according to the mental capacity of children. It was found by the long and patient researches of Binet and others, that a child of seven can answer correctly five simple questions which a child of six cannot answer. This established a mental age limit for the six-year old child. The child of ten can answer a series of questions which a child of nine cannot correctly answer, and this establishes the mental age limit of the nine year old child. Upon this series of tests extending over a long period of time, and involving many thousand of individuals, Binet worked out his very accurate grading of the mental age of children and adults. The normal adult age is reckoned as sixteen years. When a man of thirty grades at thirteen years of mental age, he is said to be three years retarded. When a child of twelve shows a mental age of fourteen, he is said to be two years advanced. While the mental age and calendar age is usually supposed to be equal, one is not said to be mentally retarded unless the difference is more than two years, because the retardation may be due to physical causes, ill health, faulty environment, and other causes. Where the discrepancy is greater than two years, these influences are not

operative, and mental defect shows itself rather definitely.

Mental defect begins with idiocy, where the mental age is under three years. Imbecility is divided into three groups; the low grade ranging from 3 to 5 years, the middle grade at 5 to 6 years, and the high grade from 6 to 9 years. Morons occur without definite upper limit, but seldom extend beyond 12 years. It is naturally difficult to fix a definite upper limit for morons, because it is a borderline state, in which imbecility shades off gradually into dull normality. Many sub-normal persons grade at 10 years, and many morons grade as high as twelve years. The nearer the person approaches to the average, the more difficult it is to establish a definite degree of deficiency. Below the mental age of 8 years, definite feeble mindedness is established. From 8 to 10 years is a border line condition of deficiency, sometimes classified as dullness, and often as feeblemindedness. From 10 to 12 is a state of mental dullness which is rarely classified as feeble mindedness.

It is in this large group who grade between 8 and 12 years that the moron is found. He is one who is up to the average physically, and in ordinary matters of a concrete character, expresses himself well, but who is unable to entertain an abstract concept, and who fails in adjusting himself to any complex environment in which logical reasoning is required. Morons are the prey to their emotions. They laugh and cry with equal ease. They have no thought of the future, or of other than the immediate consequences of their acts. They are the ones who yield easily to sex temptations, who are improvident, and who drift into pauperism. Content with satisfaction of their immediate physical needs, they have no other compelling ambition. They cannot, in the ordinary operations of daily life, be distinguished from the normal man; yet by the Binet test they reveal themselves, however physically adult they may be, as mentally juvenile.

One of the great revelations of the army psychological tests is the large number of men in all communities who are mentally juvenile without being definitely feeble minded. They are the dull normals, who pass in their environment as fairly law abiding but simple persons who are content with their stations in life, happy if they have jobs, but not much concerned if they haven't, drifting with the tide, yielding to the temptations of drink and sex, and living with not much more concern for higher things or the future than the animals they drive to the plow or the machines they tend in the factory. Great political or social changes do not concern them. Literature and poetry have no charm for their souls. Music and art gratify only their superficial and transitory emotions, and all their concerns are of a material character. "Brothers to the ox," they lead their lives neither acting nor reacted upon by their environment.

For the purposes of the army, recruits were graded into classes designated as follows:

Class A Very superior intelligence
Mental age 18+years.

Class B Superior intelligence
Mental age, 16 to 18 years.

Class C+ High average intelligence
Mental age 14.5 to 16 years.

Class C Average intelligence
Mental age 13 to 14.5 years.

Class C—Dull normal, rarely feeble minded
Mental age 11 to 13 years.

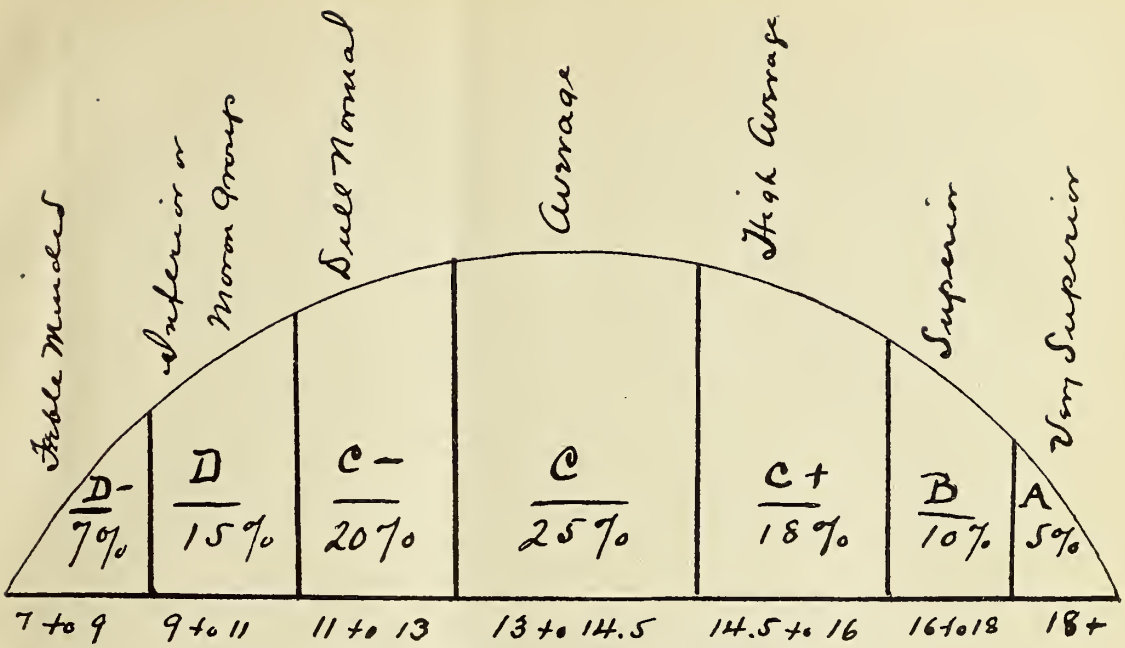
Class D Inferior, including morons
Mental age 9.5 to 11 years.

Class D—Mental defect, high and low grade.
Mental age 7 to 9.5 years.

CLASSIFICATION

The very superior (Class A) group is composed of men of superior adult intelligence, grading from 18 years of mental age upwards. They are the ones capable of receiving high school and college education. There is no limit to their intellectual possibilities. They may progress as far as their inclination and application will permit. In business and in social life they are apt to be successful. This is the class which leads in all occupations requiring very high mental qualities. They are the professional men, leaders in business or politics, who are able to apply a high degree of intelligence to the accomplishment of any purpose. From this class is selected commissioned officers of the highest type.

The superior (Class B) group is but slightly inferior to the former, and are men markedly above the average. They are able to make good records at college, to engage successfully



Intelligence grouping according to Mental Age.

in business or professions and while not as markedly active in their mental processes as Class A men, furnish to the Army a large number of commissioned and non-commissioned officers. The mental age limits of Class B is 16 to 18 years.

High Average Intelligence (Class C+), is represented by men of a grade of mental development somewhat above that of the average citizen. They are represented in society by foremen, electricians, telegraphers, railway clerks, mechanical engineers, book-keepers and similar occupations. Mentally they grade between 14½ and 16 years. They are able to complete high school and college training.

Average Intelligence (Class C) is represented in industry by shop mechanics, brick-layers, laundry-men, bakers, painters, blacksmiths, carpenters, butchers, brakemen, plumbers, chauffeurs, auto repair men, locomotive firemen and other occupations of similar kind. They as a rule receive a common school education, but rarely are able to get through the high school. Their mental age is from 13 to 14½ years.

Low Average Intelligence (Class C-) is represented by common laborers, tailors, cobblers, teamsters, miners, farmers, concrete workers, hostlers, barbers and other occupations where a maximum if physical effort and a minimum of mental exertion is required. They make good soldiers. They are rarely able to acquire education above the third grade of the elementary school, and their mental age is between 11 and 13 years, averaging a little less than 12 years. They are graded as dull normals.

Inferior Intelligence (Class D) represents the lower limit of the dull normals. They are of distinctly low mental capacity, slow in comprehending orders or in executing them. When properly supervised they are capable of doing routine and unimportant work fairly well, but combined with their mental dullness are other qualities of indifference, laziness, drunkeness and unreliability so that they could not be used to any considerable extent in the Army. They are represented by no trades or occupations, and are to a large degree shiftless, dependent, sex offenders, drug addicts, and petty criminals. This is the class which furnishes the largest percentage of morons, who live to gratify their present inclinations without thought of the future. In mental age they grade from 9½ to 11 years.

Very Inferior Intelligence (Class D-) is distinctly feeble minded. A few of them are simple rather than feeble minded, and are fit for certain common grades of work under supervision. The few who got into the army

were not trusted with anything important. They are in no sense soldier material, and as a rule were promptly sent to their homes. They rarely were capable of receiving any education whatever, though some have reached the second grade in school. Their mental age extended from 7 to 9½ years.

The grading of recruits according to these various classes is the most startling fact developed by the intelligence tests. Especially is this true when it is considered in relation to the population of the country. If this is assumed roughly to be about 100,000,000, the distribution of intelligence according to population, assuming that the results obtained in the army would apply to the general citizenship, would be as follows:

	Percent	Population	Mental Age
Class A	5	5,000,000	18 years or over
Class B	10	10,000,000	16 to 18 years
Class C+	18	18,000,000	14.5 to 16 years
Class C	25	25,000,000	13 to 14.5 years
Class C-	20	20,000,000	11 to 13 years
Class D	15	15,000,000	9.5 to 11 years
Class D-	7	7,000,000	7 to 9.5 years

These figures reveal the significant fact that 42,000,000 of the population of the United States are of the dull normal, inferior and very inferior grades, including in the two latter classes a large proportion of feeble minded persons and morons. They also reveal the fact equally startling that only 15,000,000 have reached the grade of adult mentality, and that the vast majority of our population are more or less mentally juvenile. If we assume that the psychologists are correct in estimating adult mentality at 16 years, we are forced to the conclusion that the vast bulk of our people approach the problems of life with the minds of children.

From daily experience we are able to comprehend the degree of judgment and will power displayed by the normal 12 or 13 year old child, influenced as it is by good or poor bringing up, by much or no education, by much or little experience, by moral or immoral surroundings. We can fairly estimate his capacity to resist temptation, to analyze motives and to entertain ideals. From this view of the minds of children, the ability of the average grown person with a low mental age rating to adapt himself properly to his environment is not such as to give us much confidence in his capacity to decide the problems that reach the higher levels of intelligence.

Combined with the low mental age is the other important factor of illiteracy. How great an influence has the lower three groups upon the astonishingly large percentage of people in this country who cannot read or write? If the psychological test is one which relates to the original endowment of the child, uninfluenced by edueataion and training, we should find that among the illiterates a preponderant proportion of people in the D-, D and C-groups.

Gradings have been secured on a large number of recruits but all the statistics have not yet been collected, and consequently any deductions upon incomplete returns should be very conservative. Below is a percentage intelligence rating on 88,650 white soldiers of various grades of education:

81,114 Literate Whites,

D-	D	C-	C	C+	B	A
7.45	7.90	18.87	27.87	19.97	12.24	6.30

7,436 Illiterate and Foreign Whites,

D-	D	C-	C	C+	B	A
19.28	30.20	21.46	21.21	5.26	2.62	00

It will be seen that below Class C-, whose mental age averages twelve years, fall 34% of whites who can read and write, and in the same groups fall 71% of illiterate and foreign whites. In Classes A and B the literate whites reach 18½%, while the illiterate and foreign whites reach less than 3% in Class B and none in Class A. When it is considered that these groups are of the white and do not include the colored race, it is a fair inference that the general intellectual standard of people in this country should be lowered rather than raised, as experience shows that the mental age of the negro is about one year less than that of the white race.

The grading of intelligence by these tests does not mean that the distribution of intelligence is uniform throughout the country. Wide variations are found geographically, where local causes operate to produce a low average of mentality. During my period of service at Camp Dodge, where I was attached to the Board of Psychiatric Examiners, I had

the privilege of passing upon the mental equipment of many thousands of men, coming from middle western and southern states. The white residents of the Ozark region of Southeastern Missouri and Northeastern Arkansas graded the poorest, as judged by the percentage of rejections from the service for mental defect. Next in order came the colored recruits from Alabama, Tennessee, Oklahoma, Egypt, including Southern Illinois and East St. Louis. The ratio of rejection for mental deficiency was from 1.8% to 4.5%. On the other hand, Iowa and Nebraska gave a percentage of 0.03%. The high percentage of rejections in the southern states cannot wholly be accounted for by the lack of compulsory education, but largely by the in-breeding of the negroes and the fact that in psychological tests the negro rates about one year less in mental age than the white man. The contention of psychologists that the degree of learning one possesses has little or no influence upon the grade one reaches in these tests receives confirmation in the fact that Class A and B are sometimes reached by persons who have never been to school, and that persons with a high school or college education sometimes grade in C-. It is not to be forgotten in this connection that men in the group of D rarely are able to attain to more than the third grade in the elementary school, and those in C, or average intelligence, can rarely finish the high school course. Some other causes than lack of educational opportunity must be considered to account for the coincidence that the largest percentage of feeble mindedness is found in states where compulsory education is not enforced. The coincidence is rendered more striking when it is realized that the percentage of illiteracy reaches 16% in the southeastern states, 17.4% in the south central states, and finds its highest level in Louisiana, where it reaches 29%. These figures are suggestive that where the intellectual level is low, legislation in the matter of education is backward.

It must not be imagined that the psycholgical test is an absolute and accurate measure of all of one's capacities. It is solely a test of intelligence, apart from those many other qualities which make a man. Man is not a thinking animal alone. He possesses other and more important qualities. It does adequately measure one's quickness and accuracy of perception, his ability to fix attention, the relative quality of his memory, and his power to resist suggestion. It cannot give an absolute measure of his powers of judgment, emotional control, nor his power of inhibition. It cannot test character, initiative, moral sense, selfishness, idealism, nor other of the qualties that make up the complete man. It is a fair inference that the one who excels in the former will possess the latter. The one who has good memory, power of fixing attention, and quickness and accuracy of perception is more likely to possess good judgment, emotional control, and will power than the one who does not. Occasionally, however, it is true that the test fails. One man at Camp Dodge who achieved a mark of 408 out of a possible 412 in the test, was later discharged from the officers' training school for lack of adaptability and poor judgment. The test gives us certain indices as to the quality of certain faculties, upon which we may safely predicate the general quality of his intellect. Practical experience has demonstrated the value of these tests. The rating of soldiers by officers on the results of their work corresponds very nearly with the ratings given by the psychological test.

It is probably true that if there were no psychological tests, the gradings of soldiers by their officers might achieve somewhat similar results to those obtained by the psychological test, but this takes time. It would require six months or a year for an officer to study his men to ascertain their capacities for varying kinds of work, while the psychological test gives the same information in forty minutes. Moreover, in assembling a large army, it is a distinct advantage to know at the outset what are the ratings of the soldiers, so that they may be assigned to proper tasks and a greater efficiency reproduced by a judicious mixture of high and low average men. In a regiment there may be two companies with a very large percentage of Class C+ men, while in other companies there is a preponderance of Class D men. Best results are obtained by equalizing the grade of intelligence in the various companies so that the regiment will represent the average intelligence of the soldier. The best soldiers are those of the C and C+ grades. They have sufficient intelligence to appreciate the need of discipline, can properly

understand commands, and understand the necessity and advantage of obedience.

The astonishing revelations of the psychological test give rise to incredulity, and to many doubts and questions. How does it happen that such a low mental average exists in a world that is highly civilized? What are the causes of this phenomenon? How can we account for this lack of mental development? Do not the facts of our experience and of history controvert this new discovery? Can it be that our material civilization, progress in education, refinements of life, art, literature and all the influences that go to make society better have so utterly failed to raise the standard of intelligence? These questions naturally suggest themselves, because we seldom meet people in the mass. Each one is surrounded in his business and social affairs with his equals, and is apt to form his opinions from those with whom he comes in contact. Such contact as we have with the mass is casual. We see them in factories, street cars, and public gatherings, and if they do not bear the stygmata of defect we rate them as gifted like ourselves with high intelligence. Each one rates himself as the standard, unconscious of the fact of his deficiencies.

THE REASON WHY

Consideration of the low level of intellectual advancement would be incomplete if we considered the causes of such condition to be of recent origin. Man has progressed slowly in the thousands of years since he stood upon two feet. The physical progress from the time of the Pithecanthropus Erectus to that of the Piltdown man is not marked by very great changes in the human skull, nor is the difference between the Neandertal man and the present conformation of the skull very startling, although in each of these periods tens of thousands of years have intervened. If one can imagine a ratio of progress in physical development, is it not to be also inferred that the mental advancement in those periods has been proportionately slow, and that the growth of intelligence has been almost imperceptible? While anatomical changes in the outer covering of the brain have in our imagination been vaguely associated with the conditions of life of remotely ancient races, our imaginations are not equal to the task of picturing the workings of the ancient brain to the extent of estimating their acuteness of perception, memory, judgment, emotional control, and other qualities which are supposed to be related to brain development. It is only in the brief period spanned by history that we can from any approximate estimate of the mental development of the races. The tablets of Assyria show conditions of life not very dissimilar to those of the present day. There were then the same human relationships as now, as demonstrated by business transactions, transfers of property, suits at law, divorce and other social conditions, revealing an almost parallel state of society with the present. The highest points of civilization of the Egyptians, Greeks and Romans do not show any marked difference in intellectual level from the present. Between the highest points of development recorded as ancient historical events, and those lowest points upon which history is largely mute, covering the period from the decadence of Rome to the Twelfth Century, there was probably a median of intelligence in the world comparable to the results which the present tests show. It is questionable whether the general intellectual level of our present civilization is any greater than has existed in remote periods within the limits of history. History as a rule records the outstanding events of the centuries. It concerns itself with recording those occurrences in which marked political or social changes have taken place. Kings have changed the boundaries of countries, have changed free peoples to slaves, and slaves to free people, have altered the face of the globe because of political or religious differences. Notwithstanding all these events which brought glory to their reigns and fame to their memories, the average conditions of life and the mental progress of the peasantry and workers of the world in times past have escaped the recording pen of the historian. The intellectual status of the various peoples can only be guessed at according to advance or recession of the dynasties. So far as the average individual is concerned, his capacities have been judged only by his reaction to the various political and social changes that occurred at various periods in the history of the world.

In his recent work on Contemporary History, Schapiro has remarked that Caesar could have

lived in the period prior to 1750 without noticing any difference in the social or industrial environment from his own times. It is only since the middle of the eighteenth century that the environment of men has substantially changed. Prior to that time, the individual relations were local, simple, and calling for a minimum of mental exertion. Life was primitive, and there were few adaptations necessary other than to fit the average man for the limited relationships in which he lived. Agriculture was the chief occupation, and was conducted with primitive tools to supply local wants. Manufacturers, in the modern sense, were unknown. Each home was a work shop, and the products were bartered at the nearest town. Commerce was unknown because modern means of transportation were absent, and each dealer traded with nearby cities, and only in small amounts were manufactured products exported. General information was carried by infrequent letters, and by seldom published newspapers, and books were rare and highly prized possessions. The educated were few, and their training directed to the professions and government positions only. The mass of the people were illiterate. Serfdom was the rule in Europe. It terminated in Germany in 1825, and in Russia in 1863. The conditions of life were such that the reactions of the nervous system were slow and habitual, because of the absence of the frequent and violent stimulation of a more intensive civilization. Man was a reflex arc, with few and simple stimuli to reaction.

After 1750, Rosseau awoke the world to a new viewpoint of its political and social relations. The French Revolution freed the intellect and abolished the landed aristocracy. The industrial revolution in England that followed the invention of labor saving devices changed manufacture from the peasant's hut to the factory, and drew the farmers from their peaceful valleys to the active industrial life of the cities.

The whole world was intensely stirred by these revolutionary changes. The human mind, accustomed for thousands of years to adapt itself to simple conditions to which it had been adjusted, in the sense that the reactions were largely automatic, in the relative suddenness of a century and a half, was forced to adapt itself to a complex material civilization which called for the exercise of mental qualities of an entirely different character, and requiring a resilience which is slow in coming. It is no wonder that when the intellectual response of the average person is measured in the light of these conditions, he fails to keep to the high standard to which we had assigned him.

THE SPINAL CORD MIND

There are two elementary instincts which are constantly and imperatively dominating. One is self preservation and the other is reproduction. Through life, however simple or complex, these two elementary forces constantly impel us. All our activities, however far separated they may seem to be from these two stimulating forces, can ultimately be referred back to them. The man whose activities are exerted in accumulating great wealth by the various complicated business processes, might deny that he is actuated by the brute instincts of nutrition and reproduction, but in the final analysis all his endeavors lead to his own preservation and the nurture of his children until they are self supporting. He accumulates wealth and surrounds himself with luxury in order that he may better care for himself and assure the growth of his children through the long period of infancy. Among animals infancy is brief, and their young are soon independent of the parents, but among humans infancy is prolonged, and our young need care from babyhood to manhood's estate. We are apt to forget, in view of the diversity and amplification of conditions of modern life that through our entire period of existence we are striving, by different methods, but to the same end that the animal and the primitive man strove to preserve his existence and reproduce his kind.

The higher intelligence, by means of social custom and education, can and does conceal, even from himself, the rather discreditable fact that he is an animal with primitive instincts. We rather resent the fact that the same motives, modified by circumstance, that actuate the less cultured and intelligent, are propelling forces in our lives; but nevertheless, from the unicellular organism of pre-historic times to the present we respond to the same stimuli in

very much the same way. The first organized cell group arranged itself as a hollow nutritional tube through which water was impelled and from which the cell group derived sustenance. The next step was the development of sex organs in the same organism, with the subsequent differentiation of male and female characteristics in separate organisms. The primitive nerve force was a reflex. Food elements coming in contact with the cell stimulated muscular action and were consumed. As differentiation became more extensive and animals rose in the scale of elaborate development, reflex action became more perfect and adapted to the varying relations of the life of the organism. With the development of the brain, a vast association tract with registering apparatus by which stimuli and corresponding muscular action were recorded and coordinated, the processes of reflex action became at first automatic and later became the center of volitional action.

In the hundreds of thousands of years from the beginning of evolution the spinal cord has played the greater part in man's advance, and the brain as a volitional center has been less highly specialized and of much inferior development. The spinal cord still does the larger part of our thinking. That multitude of actions of which we are unconscious, the thousands of muscular adaptations which are automatic, the many involuntary movements which preserve our lives, are presided over and carried on by the spinal cord. The brain may originate an impulse, but in the majority of cases our consciousness is not aware of the fact, and the spinal cord thinks and acts for us. In the pre-historic animals the relatively small size of the brain is compensated for by the enlargement of the lumbar and sacral portions of the spinal cord. The lumbar enlargement of the spinal cord in human beings still remains, and who can say how large a share of our complex life is taken by this rudimentary relic of our early evolutionary brain. It is not unfair to say that man in the present, as in the past, does the far larger part of his thinking with the spinal cord.

In proportion as the intelligence level rises, the brain activity increases, and the less the reflex action of the spinal cord determines the choice of motive and the reaction of the individual to his environment. In the superior mental group emotions become more highly specialized, they are submitted to analysis, they have a higher plane, and are subject to greater inhibition. What we call control of emotion is similar to the governor of a steam engine and regulates and steadies emotional response. One of the principal distinguishing features of the higher intelligence is the ability to properly control emotional output, and to adapt the response more proportionately to the stimuli. With this goes also keener perceptive qualities, greater ability to differentiate between stimuli, more capacity to associate past experience with present impulses, and a more highly trained judgment.

With the lower groups of intelligence these qualities are lacking in varying degree as we descend to the stage of the imbecile, who possess few of these faculties. In the lower group D-, D and C-, we find a greater predominance of the spinal reflex action. With slower preception, less power of discriminating attention, more faulty associative powers and markedly less power of inhibition, they respond less keenly to stimuli, and their response is more apt to be of the spinal cord rather than of the brain type. Choice of motive is governed in larger degrees by immediate wants than by future advantage. Present pleasures attract without consideration of ultimate consequences, and choice of motive is apt to be impulsive rather than deliberate. Their reactions to their environment are in line with their more primitive instincts of nutrition and sex impulse. The call of sex and stomach are immediate and pressing, with little consideration of the future. The failure to adapt themselves properly to their social environment brings them into disharmony with the social structure. They become dependent in an economic sense, and are unable to properly provide for their offspring. They tend to become paupers, petty criminals and sex offenders. Without adequate power to appreciate the value of higher things, unable to comprehend anything beyond the concrete, they are as a rule devoid of ambition, of desire to better their situation, to take any larger share of the work of the world than that necessary to nourish themselves and to repro-

duce their kind. Unable to assimulate anything beyond the lower levels of education, they become burden bearers of the world, giving in some degree their physical powers to the service of others higher in the level of intelligence. Their contribution to society is principally muscular.

GOVERNMENT

The question of intellectual status of our people is by no means an academic one. It is not sufficient to grade people into groups according to their mind power, and to leave it there as a purely interesting phenomenon. No fact of recent scientific investigation is more pregnant with meaning than that over half our population is mentally juvenile. The consequences of such a scientific discovery affects us nationally as well as individually. We are a democracy. We have a government of the people, for the people and by the people. It is our proud boast that we determine our own conditions of government, that no monarch can curb our liberties, and that each citizen has his vote in deciding the questions that concern life, liberty and the pursuit of happiness. This is no doubt true.

In the light of recent social phenomena in eastern and central Europe, the relation of low intelligence standard and spinal cord thinking to government becomes full of significance. Serfs until recent years, illiterate, deprived of all contact with things that tend to elevate, and seeing that after their new release from political serfdom they were still bound by the chains of an economic serfdom not less cruel, it is not very surprising that they have determined to destroy the instrument of their oppression, without much thought of causes or remedies. Primitive emotions rule, and in their destruction of the burgeoise they see the breaking of the bonds that withhold them from the utopia of their dreams. Upon the simple minds and uncontrolled emotions the more intelligent leaders impose their will. Unthinking they blindly follow where they are led, without thought of ultimate consequences and with the vain belief that by destroying a system they can change human nature. The present motive is to them the best one. To destroy their rulers is only to subject themselves to the autocracy of their own selfishness. Whatever good may come out of the present economic maelstrom will be due not to foresight, plan and deliberate thought, but to that innate adaptive force which gradually adjusts human relationships along lines that promote the well being of the mass of people.

We must not forget that if the intelligence of the majority of the people is upon the level of twelve years of age, we must expect that the degree of judgment which they express in politics will not materially differ from their judgments upon other concrete facts of life. The average man, being swayed by the two great primitive instincts of nutrition and reproduction, is influenced in politics by that kind of government which best caters to these two instincts. While high emotions and purposes for a time may sway him from this dull level of his plane of existence, inertia tends to restore him to the former level, and he succumbs to the inevitable law of providing for and protecting himself and his family. That form and kind of government is to his mind best which in the fullest degree provides for these two natural instincts.

On the other hand, the superior and very superior groups, with a farther vision, with greater capacity to see the desirability of changed conditions, is not insensible to higher things, and is constantly striving for the realization of ideals in government and life. This relatively small 15 per cent of the people represent what is the thinking force of the community, and consciously and unconsciously directs and controls the eighty-five percent of average people. Where the fifteen percent is altruistic, impelled by high purposes, the largest share of freedom and good government obtains, and conversely, where this small percent is self seeking and innocent of high moral aims, the masses are exploited for the advantage of the few. In the world's history the actual government of peoples has largely been in the hands of the very superior five percent. It must not be understood that the "very superior" class represent superiority in emotion or in the so-called affective qualities of the mind, or that they are superior in the sense that they are less selfish than those lower in intellectual grade. They are superior only in intelligence, and this

weapon has more often been used for the oppression and enslavement of peoples than for their up-building and freedom. The dynasties which have ruled the world have acquired and maintained power by their superiority in intellect alone, and the finer qualities of the mind have not been their predominant possession. In government, in politics, and in commerce, power and wealth have gravitated to the very superior five per cent, and has by them been wisely or tyrannically used according to their inclinations or necessities.

In practical, modern politics, it is not difficult to discern how the "very superior" unscrupulous and selfish politician, appealing to the primitive instinct of nutrition by a shibboleth such as the "full dinner pail", "high wages", "pauper labor of Europe" and other empty political promises, sways the average voter to his side. However often the mass of voters has been deceived, it is always ready again to be betrayed by the same devices, for children slowly become sophisticated, and the lower fifty percent of the voters will always remain children.

Theoretically we govern ourselves, but by what miracle do the fifty million of mentally inferior control the destinies of our country to their own good? Whence comes the wisdom that shapes the policies of government and carries out the high aspirations of democracy? What part other than passive actors do the fifty per cent who are below average take in our political scheme? How can a democracy continue to exist except in name in a country where there is a high percentage of illiteracy and a majority of the people are controlled by instinct and emotion rather than by a high and competent degree of intelligence? Is it not a fact, regret it as much as we will, and ignore it if we can, that even in our democracy there is a controlling force composed of the five per cent of very superior intelligence who shape the policies, frame the laws and execute them for the benefit of the larger mass of people? Democracy, the rule of, by and for the people, is an ideal always striven for but never quite reached. In every country and time democracy has probably been the same, and the blessings of free government have always depended upon the wisdom, altruism, and purity of motive of the small controlling class. When the superior intelligent element have forgotten or betrayed their principles democracy has always given way to other forms of government, and again will do so. Disguise the situation as we may, the freedom of the people depends upon the high and pure aims of a small proportion of our voters.

EDUCATION

In the educational field the psychological tests have a most important place. This has already been recognized by Columbia University, which has dispensed with the customary entrance examination, accepting the candidates' credits as evidence of work performed, and subjecting him to a psychological examination to ascertain whether he is worth educating further or not. This method eliminates from college those whose natural gifts have been shown to be insufficient to make satisfactory progress.

The psychological ratings of the army show that the engineers occupy the highest place, the artillery men coming next in grade, while the physicians drag along near the bottom of the scale, surpassed in downward rating only by the dentists and veterinarians. During the past two years there have been many more applications for admission to the freshman class in the Medical Department of the University of Minnesota than the teaching faculty could properly instruct. It was decided to eliminate undesirable students by psychological examination. The result was most happy, for the ratings of the successful candidates equalled the high standards of the engineers and artillerymen. It is safe to predict that these physicians will make good in their profession, and will bring to their work the high intelligence that their exacting calling demands.

It is especially in the grade schools that the benefits of psychological examination will show the best results. The schools are in a rut from which in the past there has been no escape. Children enter the lower classes and are promoted usually upon their performance, but a certain percentage proves to be backward, and unable to learn. After the teacher has exhausted all her arts in trying to instruct this group, and the children have been two or more

years in the same class, they promote them on account of their age, there being too great a discrepancy in years between the young bright pupils and the older dull ones. The mentally retarded pupil is the bane of the teacher, and he acts as a retarding factor upon the rest of the class. All children, however, have to go through the same process, little allowance being made for differences in mental endowment, and no attention being paid to the fact that they cannot absorb and retain what they have been taught. The result is that backward pupils are often promoted regardless of their past performance, and with a view of grouping children of the same age together. It is easy to see the damage done by this unscientific system, and at the same time it is realized that the new tests render its correction easy. The Binet test applied to all pupils of the public schools at intervals of two or three years, determines within practical limits those children who are unable to make progress and who act as a retarding influence upon their brighter companions. By this method it is possible to group the mentally deficient in special classes for instruction. These classes may then be taught by a more objective method those things which their mental equipment fits them to learn, and they will be spared the humiliation of being the stupid ones in classes of smarter children. The cost of our school system would be materially reduced if such a plan were inaugurated, to say nothing of the very much increased efficiency in the matter of results.

More important than all is the fact that by occasional psychological examination at the various grades below the eighth the pupil's capacity can so be determined that his fitness for future occupation in industry can be demonstrated with approximate accuracy. It is futile to send through the curriculum of a high school the child whose mental age puts him into the C class, a group whom experience has shown rarely are capable of receiving a high school education. Children of the C-group with difficulty complete the grades, and the D group rarely gets above the third or fourth grade of the elementary school.

We must recognize, whether we like it or not, that there are backs made for bearing burdens, as well as heads made for directing and managing the affairs of the world. It seems almost treasonable to say that in this country men are not born equal. Such, however, is the fact, and in no manner does this inequality show itself more plainly than in the intellectual equipment with which people approach the serious business of living. Lack of recognition and acceptance of this fact by our educators has been productive of great inefficiency by waste of effort in our school administration, and of disastrous dislocation in industry by improper kinds of education.

Our educators must realize that ninety-five per cent of the people are manual workers. Why not educate them for vocation? Why waste years, money, hopes and endeavor in giving a highly cultural education to our youth? Why not fit them when the grades are finished for industrial pursuits? Why not draft to simple employments those who are unable to go beyond the fourth or eighth grades, and educate to promote the efficiency, economic advantage and happiness of the toiler.

IMMIGRATION

How may we improve the intellectual standing of our people? No plan is so obvious as that of filtration of the blood that comes to us from foreign shores. At present the ability to read and write and the possession of forty dollars is the passport of the immigrant to this land of liberty. Mere ability to read and write is no criterion of the desirability of an immigrant, and any dishonest person, with due diligence, can acquire forty dollars. The undesirable class of immigrants are the paupers, criminals, sex offenders, morons, imbeciles, and those whose inadequacy prevents them from taking advantage of the opportunities which our democratic institutions offer. Most of these classes are embraced in the inferior and very inferior groups, with a mental age of less than eleven years. The tendencies of immigrants and their desirability as citizens can with relative certainty be determined by psychological examination at the port of embarkation. If we are to have any restriction upon immigrants we should see that those limitations are such as will with relative accuracy eliminate those who are distinctly obnoxious. A test which demonstrates the mental age throws light upon the tendencies and limitations

of people, and appears to afford a desirable way of eliminating the unfit from our shores. By this means it is practicable for us to place a bar against pauperism. The low mentality that is unable to see beyond the present, that is unable to provide for more than immediate wants and unable to take advantage of American opportunity should find no place on our shores. From fifty to seventy per cent of prostitutes are high grade imbeciles or morons, and immigrant sex offenders might be largely eliminated by a psychological test. Petty criminals and others of higher grade are most numerous in the D and D- groups. Would we not protect society and lessen the financial burden of our reformatories and prisons by excluding these potential and actual criminals? While morality and character is not determined by the intellectual standing, it is a matter of experience that with low intelligence goes failure of judgment and inhibition, the two mental defects which are most prominent in the criminal. If we are ever to improve the blood of this country it must be by diluting it with a better strain, and in the determining of the mental age of the immigrant we have a means of testing the quality and purity of the diluent.

THE REMEDY

Is there any remedy for the conditions which grow out of the unequal distribution of intelligence? Is it not possible that by means of education, improved environmental influences or moral teaching that the quality of our citizens can be improved? These questions naturally suggest themselves, but they are hard to answer. Water will not flow higher than its source. The Class D boy cannot reach above a certain grade in school, no matter how long he goes to school. One can be educated only up to one's capacity to receive education. The limits of one's mental machinery determine the amount of learning one can absorb. We are what we started with, and only by the slow processes of evolution can our adaptability to our environment be increased. The history of the Kalikak family, the Hill folk, the Jukes and other notorious instances of transmission of mental feebleness through several generations illustrate the tendency of like to reproduce like, and of the feeble mind to generate defectives. Such exceptions to the rule as occasionally occur are atavistic. Defectives reproduce their kind in a ratio of two to one as against normal persons. Purifying the stock may be accomplished by eugenic methods, but their enforcement does not appeal to the mass of the people, and practical consideration of them must be abandoned. Eugenics should always be applied to the other fellow, but not to ourselves. Whatever society at large may think of us, we are always conscious that we are better than someone else, and that limitations of capacity of reproduction should be applied to others, and not to ourselves. Who is to determine the ones upon whom vasectomy is to be imposed, and who is wise enough to convince people that they should not marry? Will people tolerate and enforce laws that limit what is regarded as a natural function?

Improving the environment of people who are dependent and who are unable properly to adjust themselves to their surroundings has been tried by many philanthropic societies. Where maladjustment is due to temporary and local conditions much benefit has resulted. What charitable society has not upon its list people who have been assisted for ten or twenty years without material improvement? Model tenements have been provided with bath-tubs, which are ordinarily used to store the supply of coal. Something more than outside help is necessary to change the conditions of the dependent and pauper class. There is a condition of mental inertia which must first be removed. Helpless contentment with one's situation is the sign of mental inadequacy, and the symptom of chronic and hopeless submergence. Those of our people who are in Class D- and D cannot be lifted out of their situation by extraneous influences, nor can they extricate themselves by any means within our present knowledge.

Moral influences are the greatest lever in elevating and improving citizenship. While intellectually dull the average citizen is emotionally hyperactive. Playing upon emotion is followed by an immediate response either for good or evil. In response to the specious and attractive promises of the political demagogue, they readily "throw their sweaty night caps in the air". They will follow leadership of an emotional kind, and when the proper appeal is

made they throw their whole force in the right direction. Herein is the value of those social stimuli which take the form of religious teaching, patriotism, national and racial pride. If their ideas of social justice and altruistic aims and purposes are aroused, there is no length to which they will not go in support of justice and right.

While it is practically futile to try to educate those in the lower end of the intellectual scale higher than the limits of their mental machinery, the very superior class is not thus restricted. The sky is the limit of their educational possibilities. This is fortunate, for the well being of society depends very largely upon the proper use of high intellectual gifts by those who possess them. It must not be understood that with a high perfection of intellect goes a smaller proportion of vices than accompany less distinguished ability. It cannot be said that Class A men are more moral, unselfish, altruistic, or have finer characters than those less gifted. It is unfortunate that the higher the intellectual capacity, the more powerful it it for the exercise of selfishness, disregard of rights of others, and similar undesirable qualities. Education of the very superior class need not take the form of scholastic training, but must be education of a moral kind. Education of the superior and very superior classes is imperative. They must be taught the lessons that neither history nor human experience has yet taught them. They must learn that the inferior groups were not created to be exploited, that the brotherhood of man is a reality and not an empty phrase, and that their superior endowment must be used for the benefit of the race rather than for personal agrandizement. They must learn that justice in private and business affairs is as necessary as in public matters, and that the safety of our democratic institutions depends upon the ability of those richly endowed to refrain from taking advatage of those less gifted. They must learn that selfishness is despicable and hurtful to the individual as to the state. They must before it is too late, learn that their responsibility is the greater the more their power for good or harm is increased by their intellectual superiority. Unless they learn well the lesson that their duty is not to themselves but to the state, and to those who are less fortunately endowed, what perils may not threaten. Upon their education in moral responsibility rests the progress of civilization.

ACUTE MASTOIDITIS*

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Mastoiditis develops when a preexisting suppuration of the middle ear extends to the mastoid cells. Obviously then, we cannot intelligently discuss mastoiditis without, at the same time, considering otitis media purulenta. Furthermore, otologists are inclined to believe that there is some mastoidal involvement in every case of aural suppuration.

With rare exceptions the primary antecedent infection has its beginning in the nasal chambers, naso or oro-pharynx, following measles, scarlatina, tonsilitis or influenza. Occasionally, it results from bathing, diving or the promiscuous use of the nasal douche.

We have come to regard a simple myringitis, or even a lusterless tympanic membrane, especially in adults, when other signs of tympanitis coexist, quite as characteristic of acute middle ear involvement as the classical red and bulging drumhead.

In children the Eustachian tube is shorter, straighter and of larger caliber,—mechanical reasons which expain why the drumhead resists destruction much longer than in adults, as the aural discharge quite readily finds its way to the epipharynx.

When confronted with an impending or actual acute aural suppuration, our efforts are at once directed to measures which are intended to terminate the purulent condition of the middle ear and prevent a further extension of the process of the mastoid cells. Knowing that prompt and adequate tympanic drainage is the only rational therapy for acute aural suppuration, as well as being the most effectual means of limiting the disease to the tympanic cavity. we must in obedience to sound surgical principles, replace the older practice of merely puncturing the drumhead (paracentesis), by a free incision (myringotomy).

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In performing myringotomy we should bear in mind that the tympanic membrane is placed at an acute angle to the floor of the external auditory meatus and, therefore, in making the incision, the knife must be moved inward when the incision is made from above downward, and vice versa when the stroke is reversed. Personally, I prefer to begin the incision at the upper posterior quadrant of the tympanic membrane i. e., about on a level with the short process of the malleus, cut downward to a point near the floor of the meatus and then forward for about one-eighth of an inch. This produces a flap-like opening and makes for adequate drainage.

In order to visualize the field, a bayonet shaped myringotome should be employed,—the cutting edge of which should be superlatively sharp, as otherwise the membrane will be torn or the incision more or less ragged.

Leucocytosis and increased polynuclear percentage are always present when the mastoid cells are involved,—the white blood count being increased from one to eight thousand and occasionally mounting above twenty thousand. Therefore, considerable information may be gained from a comparison of daily blood counts.

Roentgenograms are of little value in the acute cases of mastoiditis but yield considerable information during what may be termed the subacute stage. At this period a good plate will usually show cloudy areas corresponding to the pathology within the mastoid bone. Furthermore, roentgenograms are valuable in indicating the position of the sigmoid sinus.

For years otologists have been familiar with the fact that temperature is not a constant symptom of mastoiditis; that while usually present in children, it is frequently absent in adults, even when there is extensive destruction of the mastoid cells.

During the first few days following the onset of acute aural discharge, the post auricular area is acutely tender, due to sensitiveness of the scalp tissues and the mastoid periosteum, but, as the mastoid bone is not sensitive, no significance should be attached to this symptom until later when if there is pain elicited by pressure over the region of the mastoid antrum or tip, we may safely assume that mastoiditis is present. However, it should be remembered that even in those cases in which other symptoms of mastoiditis are pathognomonic, local tenderness may be absent when the external corticalis is very thick and the periosteum unaffected.

When myringotomy has been done, or the drumhead has spontaneously ruptured, and the perforation enlarged, if small, what are the signs indicating that the tympanic process has not been stayed and pointing to an invasion of the mastoid cells?

Of paramount importance is an early bacteriologic examination of the aural discharge to determine the pathogenic micro-organism responsible for the infection. Mastoidal infections induced by the staphylococcus or streptococcus viridans, are rarely seen—the streptococcus hemolyticus being the usual organism found. Occasionally the streptococcus capsulatus predominates and, knowing that such infections are vicious and frequently fulminating in character, we at once become alert for the first signs indicative of mastoid envolvement, as the extension and destruction are so extremely rapid that very few patients recover without operation. In other cases, where the offending organism is less virulent then the streptococcus capsulatus. several days may elapse before the tympanic membrane perforates. There is also another class of cases observed, in which the tympanic membrane remains intact for two or three weeks. In three cases of mastoiditis recently operated, the pneumococcus was, in each instance, the predominating organism and the process was quite rapid and destructive,—the acute aural infection eventuating in mastoiditis in from five to eight days.

When the hearing becomes markedly impaired and there is a sudden cessation of the aural discharge, indicating an interference with drainage, the evidence of mastoiditis is conclusive and operation is indicated.

When tympanic discharge and severe pain persist for several days after free drainage has been established, the mastoid cells should be opened, as clinical evidence has proved that these are the cases classed as the hemorrhagic type of mastoiditis in which there is bleeding throughout the operation and the cells are filled with pus and bloody granulations.

There are two other manifestations of mastoiditis so full of meaning that they have been authoritatively accepted as pathognomonic evi-

dence of mastoiditis. First is the otoscopic picture. By direct inspection we note a shortened and contracted meatus, due to the edema of the upper posterior portion of the drumhead, and the accompanying prolapse of the corresponding portion of the meatal wall. Since the two meati are symmetrical, a comparison of the two will disclose the striking difference. Second, a persistently profuse discharge from the middle ear, especially when pulsating which continues over a period of ten days or longer, can be interpreted in but one way—that the excessive amount of pus cannot be furnished by the middle ear alone and that at least the mastoid antrum is sharing in its production. What could be more convincing of the truth of this claim than to note the prompt cessation of the aural discharge within a few days following mastoidectomy!

The addition to the foregoing group of symptoms of mastoiditis of insomnia, loss of appetite, constipation and the general septic appearance of the patient, completes the picture.

Mastoidectomy performed before complications supervene, is attended with little risk, even when the sigmoid sinus and dura are uncovered for inspection, as the danger of infection is slight providing the dura is not wounded at operation.

When operation is delayed until thrombosis of the sigmoid sinus, meningitis or brain abscess develop, the mortality is high, despite prompt surgical intervention.

Finally, if acute purulent otitis media is allowed to continue until the condition becomes chronic, making it necessary to perform a radical mastoidectomy, with the attending loss of, hearing, we are grossly guilty of neglecting to embrace an opportunity, by earlier operation, to conserve hearing, or even life, in many instances.

While conservatism is a commendable thing, it is surely not expressed by deferring myringotomy or mastoidectomy, when indicated.

DISCUSSION

DR. H. I. LILLIE, Rochester: I have been very much interested in Dr. Lewis' paper, particularly with reference to acute otitis media and mastoiditis, and I would reiterate what he said about early incision of the membrana tympani when there are signs of acute suppuration of the middle ear. The proportion of mastoiditis that develops in acute otitis is dependent upon the length of time that the middle ear has been left unopened. The more time infection has to work in the middle ear before drainage is instituted, the more we can expect to have complications.

As to the incision, I prefer to make the triangular incision as it affords a freer opening in the drum head and it is less necessary to make secondary incisions. I start the incision below and go up, and if there is any fullness in the canal wall, I make an incision through that. It will sometimes drain the middle ear better than an incision in the membrane tympani or the tense portion of the membrane itself. The infection usually starts with the streptococcus, and if the membrane is opened early the discharge is thin and watery and drainage free. The course of an acute otitis media may run anywhere from several days to several weeks without untoward symptoms, resolution finally taking place and resulting in as good hearing as the patient had before the onset of the trouble.

It has been pointed out that the streptococcus pyogenes is not so hazardous a risk as the streptococcus hemolyticus. The streptococcus capsulatus is likely to produce untoward symptoms early. In the presence of an acute otitis media, it should be customary to culture the organism in order to determine what you have to deal with. The streptococcus hemolyticus and mucosus capsulatus are fulminating organisms and produce many of the complications early.

The age and physical condition of the patient are important. In a child the outer sutures of the temporal bone are not closed as they are in the adult. The cortex is not so sclerotic, and in a chilld I think we can look for less untoward symptoms than we can in the adult. When the patient is advanced in years and the cortex is markedly sclerotic, it is easier for infection to travel along certain channels than it is in the child. That is an important point to remember, for the reason that it indicates earlier operation in an adult than in a child. When the superior wall droops down into the canal very early and pretty nearly obliterates the middle ear structure, it means that the small bone cells of the superior wall or near the mastoid antrum are infected and are producing swelling of the periosteum. In our experience, when we encounter night pain and insomnia, we have found that either the sinus or the dura was uncovered by the disease process.

As to the complications we have encountered in connection with mastoiditis, in a series of seventy-eight mastoid cases we have had various complications. In addition to a case of lung embolus, we have had one case which resulted in empyema, and this particular patient was operated under local anesthesia. The mortality was very low. We have had only two deaths which resulted two weeks later from erysipelas, so that the mastoid operation is a safe and life saving measure in the presence of

complications and should be instituted as soon as possible.

DR. E. W. BENHAM, Mankato: There is one point in connection with mastoid diseases that I desire to call attention to: In some cases the symptoms are so obscure that we are in doubt whether mastoid complications are present or not. In such cases we naturally, to clear up the diagnosis, try to determine the presence of infection in the ear and its progress from there to the mastoid process. The absence of middle ear symptoms under such circumstances cannot be relied on to exclude mastoid involvement, because it is possible for infection occuring in the nose and throat to pass through the Eustachian tube with little or no disturbance in the tympanic cavity and enter the mastoid process and produce there or beyond complications which are important and dangerous. I have seen one or two cases of that kind, and I have no doubt Dr. Lewis has, and a good many cases have been reported in the literature. It is a thing worth remembering. We cannot always be sure that mastoid complications are not present because of the absence of well defined local symptoms in the middle ear.

DR. LEWIS, (closing): The discussion provoked by my paper, indicates the interest which the subject deserves. It was written with the intention of being helpful to the general practitioner who is usually the first to see these cases. As Dr. Lillie has said, we may with safety defer operation in children much longer than in adults for the reason which he has pointed out. There is a feeling among many medical men and lay people that mastoidectomy is a dangerous operation; this is errorneous. As a matter of fact, simple mastoidectomy may be painlessly performed with local anesthesia. Of course, when operation is delayed until the complications referred to in my paper supervene, we are confronted with a very serious condition. I believe the tendency has been to depend too much on what is termed expectant treatment for aural suppuration. Now that the manifestations of mastoiditis are frank and well understood, the mastoid cells should be opened before complications arise, thereby promptly terminating the purulent condition, preventing complications and perserving life and hearing as well.

ROENTGEN EXAMINATION IN EYE INJURIES WITH FOREIGN BODY LOCALIZATION*

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Minneapolis, Minn.

Eye injuries are of vital importance to the general practitioner, who is first consulted. The results of such injuries are often so marked that they cannot escape even a superficial examination. The reverse however, is frequently found, when the entrace wound is so slight that it often escapes rather careful search. The patient presents few symptoms, he suffers no pain. His attention is directed to his loss of vision, which may be slight. The opportunity to save sight is often a matter of hours or possibly days and the recognition of the extent of such injury is the obligation placed upon the first physician consulted. Because loss of vision is often the only symptom present it is important to secure every possible examination without delay.

The saving of eye-sight received a great impetus with the advent of the magnet, and it was of equal importance to discover that the X-ray would reveal not only the presence of a foreign body, but permit its accurate location. This discovery called attention to the weakness of the magnet as a diagnostic agent, together with some actual risks in its use prior to a definite localization of the foreign body. This briefly presents the necessity for roentgen examination in every case of eye injury, attended with a partial loss of vision. The added difficulty of removal, because of structural changes taking place within the eye, makes it questionable whether one is safe to wait even a few days. It is the effort of this paper to present the possibilities of roentgen diagnosis, the accuracy of foreign body localization, and to discuss errors incident thereto.

It grows out of the examination of 231 cases, referred because of penetrating eye injuries. The writer makes grateful acknowledgment to the (30) oculists who referred these cases and gave timely assistance in development of points of technique. Fairly accurate date are available for 227 cases as follows: Right eye injured

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108; left 119; men 190; women 11; children 26. Foreign body found in 109 or 48 percent.

Eye localization involves the same processes used in locating metallic substances in other portions of the body. To secure this, it is necessary to have the foreign body shown upon the plates in relation to some fixed object. The plan of projecting the rays through the injured part, and again at right angles for two views, while very satisfactory in the extremities, is rarely available for eye purposes. The two reasons are; first, the difficulty of showing small particles when the patient is examined in the anteroposterior direction; and second, the uncertain position of the eye during such examination, because the eye is covered by the plate.

In marked contrast to the above, it is easy to show even minute metallic substances with a side exposure. Fortunately more than 90 per cent of eye injuries are due to metallic projectiles and most of these are magnetic. Two side views are necessary. The eye remains fixed while the target is moved the average pupilary distance (6cm) for the second exposure. Having a metallic indicator at a measured distance in front of the center of the cornea for the fixed point, the foreign body is measured in relation to it. Wires are arranged immediately next to the plate for convenient measurement. These should be placed so that their shadows do not cross the region of the orbit but close to it. The target distance used is 50 cm from the plate. This places the indicator usually 2½ to 3 cm from the plate. Three measurements are necessary. Two of these are direct viz: The distance back of the center of the cornea, and the distance above or below the horizontal plane. If the operator has carefully centered and measured the indicator, he will have little difficulty in recording these two measurements. This constitutes the exact part of the process and an error of more than a fraction of 1 mm should not occur here. The third is secured by triangulation and records the position of the body on either side of the perpendicular plane. It alone desides whether such body shown upon the plate is within, or at the side of the eye, or even within the opposite orbit. I have had two such experiences, finding the foreign body in the opposite orbit. A medicolegal case, No. 163, showed a foreign body on the temporal side of

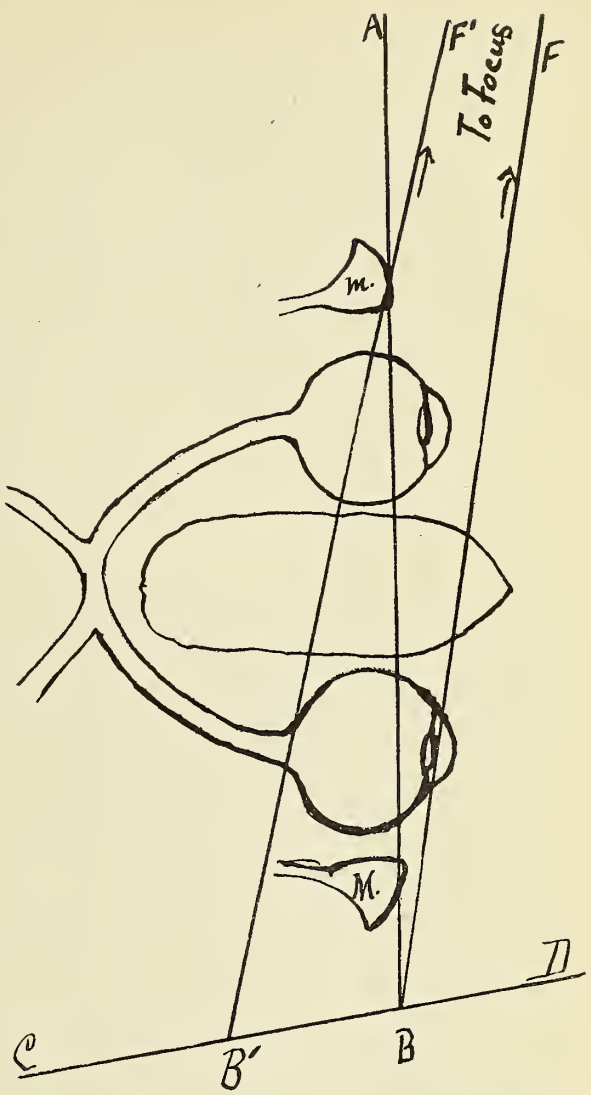

Fig. 1. Drawing to illustrate horizontal section of both orbits. C-D plate, M-M malar bones, F-B proper angle for rays, A-B improper angle for rays.

the opposite orbit, but none in the injured eye. Case No. 224 showed two foreign bodies. One, that of the immediate injury was located in the posterior sclera, while the other, the result of a former injury, was located in the nasal side of the opposite orbit. Unfortunately the above triangulation is not so exact as the other measurements and an error is possible up to 2 mm.

This localization procedure is best known as the Sweet Method, and manufacturers have produced two forms of the Sweet apparatus for such examinations. The original type is not only the simplest but the least expensive one. The improved is not free from objections. 1

have used a modified form of the original type. Of these modifications, one, a chin holder, seems to have considerable importance. Because accurate measurements in millimeters are required, it is necessary to have the greatest possible head fixation. The ordinary provision did not fully accomplish this purpose. Careful measurements before and after exposure showed that the head moved several millimeters. This made accuracy impossible. To overcome this defect I devised a chin support which makes with those already in use, a triangular head fixation quite immovable.

The patient lies upon his injured side, fixing the eye upon a target at the same level, placed at a distance of five or six feet. You will note that when the patient takes this position the axis of the eyeball has changed inward towards the midline about ten degrees from its normal. This need not be considered except when the foreign body proves to be in the orbit, when corresponding correction must be made. It is important to center the indicator a few millimeters in fornt of the cornea, and to note the accuracy of such centering, and also its distance from the cornea, immediately before the exposure is made. This is perhaps the most important step because all measurements are made from the point of this indicator. There are two methods. The millimeter rule may be placed directly against the cocainized cornea which is the more accurate one, but this causes, in some patients, enough eye movement to prevent accurate centering of the indicator. The other method consists of measuring the distance with the eye closed, making sufficient pressure to overcome the thickness of the lid.

For eye fixation the operator is almost wholly dependent upon the co-operation of the patient Here the elements of fatigue and anxiety play a most important part. The slightest movement is fatal for localization. Oculists may not realize this, for they constantly operate while the eye makes slight movements.

Movement of the foreign body with the movement of the eye has been utilized to prove its presence within the eye. To some extent this is correct. A recent case, however, is an exception. The location was too far outside to raise any question of possible error. That it moved with the eye was evidence that it was probably caught in the eye muscle, and so responded to each eye movement. This movement has less diagnostic value the nearer it lies towards either pole. The above measurement should be repeated immediately after the second exposure. It is reasonable to suppose that, if these two agree perfectly, the eyeball has remained in this position during the few seconds intervening. If they do not agree, triangulation is impossible. Whenever the foreign body proves to be close to the scleral margin it is necessary to check the examination. This is done by keeping the target in the same position for both exposures, the eye for the first exposure being as in the other examination, and for the second it is moved thirty degrees upward or downward, care being taken that the patient does not move the head in this procedure. With this movement of the eyeball the foreign body moves with it, if it is within the eye, or if it is fastened to its outer portion. It is of utmost importance to know whether the foreign body is within or without the eye. Plates should be over rather than under-exposed, and all negatives should be re-examined in another direction. Regarding accuracy, I have repeated an examination of the same patient some days apart, with a variation of less than one millimeter. It is sometimes impossible to secure the same point for measurement because the foreign body appears very differently in the two exposures.

Serious possible errors are made when the oculist depends upon the magnet for his diagnosis. Failure to get a "pull" with the magnet does not constitute a safe negative diagnosis. Many oculists insist that its use prior to localization does serious and unnecessary injury to the eye. But failure to get "a pull" is not infrequent, when localization permits placing the magnet very close to the foreign body. This may indicate that the body is non-magnetic, but frequently, persistence proves its magnetic quality.

Errors will be less if one is able to keep the patient free from fatigue and anxiety. This is particularly true when the roentgen examination follows the efforts of removal by the magnet. I have come to regard the first as more accurate than any subsequent examination because of the fatigue element. This is noticed particularly by the patient's failure to keep the eye fixed upon the indicated object.

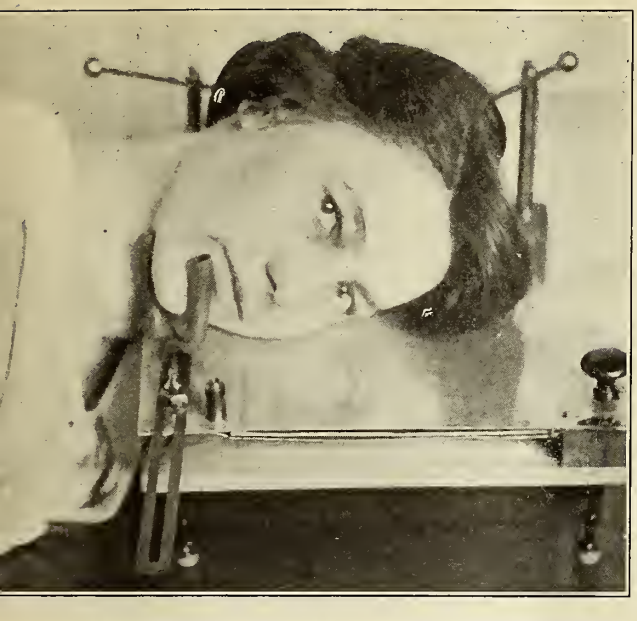

Fig 2. Chin holding device. Indicator removed.

One cannot avoid some chagrin when failures occur. It is remarkable, however, that among careful workers so small a percentage of failures is recorded either in diagnosing the presence of the foreign body or in its localization.

Regarding the diagnosis, failures to find a foreign body when present are reported as follows: Sweet (Oph. Rec. Oct., 1909) reports two failures to show steel when present. Arcelin (Rev. Gen. deOph) reports a negative that proved positive, and Randolph (Ophthalmology) reports two negatives that proved positive upon enucleation. Doubtless many failures are not reported. I wish to report two cases. Case No. 185, my own examination, showed no evidence of foreign body on the plate, but upon enucleation a very thin shaving of steel was found, which presented its edge towards the rays. Another, case No. 162 had steel present, but a clear plate taken by a neighbor roentgenologist does not show it. My own examination shows steel 2 mm x 1 mm that was located in the vitreous. By the courtesy of the first examiner, I am able to show you both plates and so demonstrate the necessary position of the tube in relation to the patient. If you make a horizontal section of the orbit at its mid-point there is revealed triangular densities of the malar bones, which form the outer orbital border. A plane drawn through these two borders bisects the eye in its average position, passing very near the equator. In the plate that does not show the steel, the rays were directed through these two dense malar bones, and the steel was located in the same plane. The position described by Sweet in his earlier article places the target a little in front of the eye. The reasons for doing so is to avoid having the opposite malar bone appear in the area examined. The approximate angle should be about 10 per cent. This throws the opposite malar shadow entirely back of the injured eye.

Having demonstrated the necessity for placing the target anterior to a plane running through the two exterior orbital borders it is necessary to consider certain corrections because of this position. When the forward

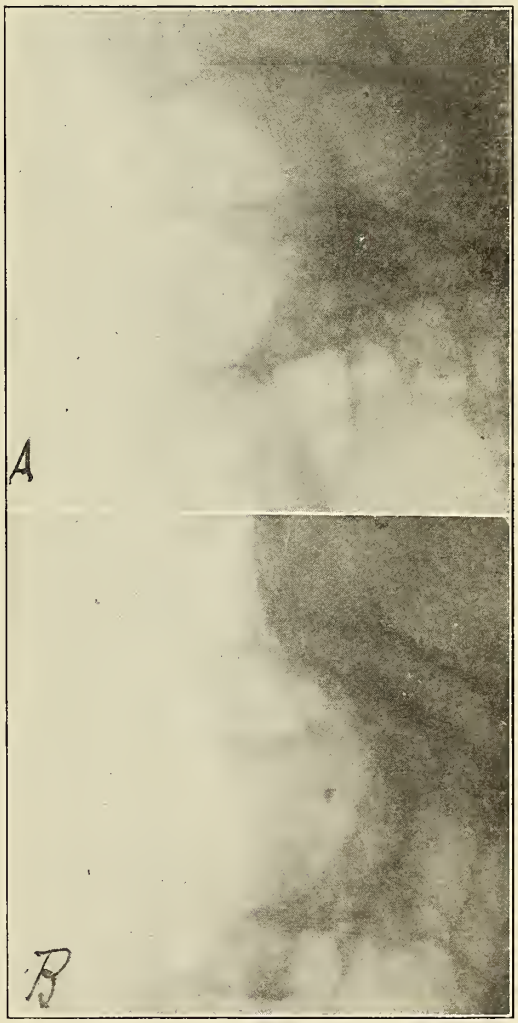

Fig. 3. Case No. 126. A. Examination not showing steel present. (Rays directed in line A-B, see Fig. 1.) B. Examination made as indicated by line F. B. of same individual.

angle equals 10 degrees, it is noticed that the following displacements occur. If the indicator distance is 40 mm from the plate, its plate shadow is displaced backward from the perpendicular 7 mm, while a foreign body, lying in the horizontal plane, 32 mm back of the indicator is displaced 10 mm. If the foreign body is at the equator 10 mm above the horizontal plane its displacement is 12 mm, but if located at the equator 10 mm below, its displacement is only 7 mm. After making the above corrections we have the two measurements which are the most exact.

Recapitulation

For diagnosis the three essential points are an angle of choice 10 to 15 degrees forward, an overtimed plate, and each negative result examined at other angles.

For localization fixation of the head and eye should include chin fixation. Time enough to secure the patient's co-operation and make measurements before and after exposures. An adjustable indicator fastened to the plate holder, a second examination with eye movements, care to avoid additional fatigue, and in charting the results, proper corrections.

DISCUSSION

DR. W. L. BENEDICT, Rochester: The subject of foreign bodies in the eye and their more accurate localization is of extreme importance to the oculist as well as to the radiographer. It makes a great deal of difference to the operator as well as to the patient whether the foreign body is in the eye or out of the eye. With the best methods of localization, especially the Sweet method, and other methods of triangulation, errors in localization have been reduced. A foreign body in the anterior chamber, or in the lens, can be seen by external examination. By the use of focal illumination and transillumination foreign bodies can be seen in the lens which otherwise could not be observed. They are sometimes missed in a radiograph. A foreign body, if it happens to be near the equator and is localized inside, may mean enucleation of the eye; if definitely localized outside some effort may be made towards saving the eye. Frequently foreign bodies cannot be found at the first examination. I think Dr. Donaldson has timely emphasized the point that more than one examination is desirable. Because not only may the patient move his head or eye, but it becomes very hard in cases of lacrimation and photophobia for the patient to fix properly, and if the patient is not able to fix properly with the injured eye it makes it much harder for the radiographer to be sure of his localization. He may have movements of the eyeball or of the head to contend with and, what is often overlooked, radiographers know there is a chance for the error in the Sweet tube stand setup of the X-ray apparatus itself. While shifting the tube from a vertical to a slanting position there is a chance for deviation because of change of position of the eye or head, which, when projected on the plate, will make a difference in the reading. It may throw the foreign body inside the sclera or outside the sclera. It is very proper to have more than one set of plates. Put the tube stand on another table, place the patient's head in a different position, and sometimes we find enough difference to pay us for doing it.

It was a common practice before the advent of the Sweet apparatus to have the patient look up and then look down; if the foreign body showed in two different positions, it was in the eye. If it did not show any movement it was outside the eyeball. I am glad Dr. Donaldson discourages that practice. A single plate taken sidewise or at an angle may show apparently a foreign body in the eye, when, as a matter of fact, it is far from the eye. It may be not only outside of the eyeball but outside of the orbit itself.

The rigidity of the tube setup must be emphasized. Given these factors, rigidity of the tube setup, rigidity of the patient, and control of the movements of the eye, we may secure, indeed, sharp localization. Foreign bodies near the equator either anterior or posterior to it may be localized inside the eye when actually they are outside the eye. It is feasible to localize foreign bodies from three exposures with the same tube setup, with the Sweet outfit. The advantage of this is that we have one vertical and two slanting rays coming from different directions which allow triangulation from both sides. In cases of multiple foreign bodies in the eye, they can be localized, even though they be close together in the same plane. In case of large foreign bodies with curled edges, two ends or two sides can be definitely localized within half a millimeter by the three exposure method of triangulation. The size of the wound, absence of signs or symptoms of injury, is no indication for not taking radiographs.

I believe the localization should be worked out by the radiographer and not by the surgeon, for the reason that the radiographer knows which exposure came first, and knows which is the slanting ray exposure and which the vertical ray exposure. While the oculist-surgeon should be familiar with the methods of localization, the actual localization should be made by the radiographer, and then when the case comes to operation the radiographer should be there to lend his assistance to the operator.

DR. J. D. LEWIS, Minneapolis: Dr. Donaldson,

who is one of the pioneers in this field in Minnesota, deserves much credit for the character of the work he has done and we are fortunate in having available, one who has made such close study of the subject to whom we may appeal for accurate information concerning these cases.

What does the ophthalmic surgeon do when the roentgenologist has located a magnetizable foreign body in the eye? If it is in the anterior chamber, it is a simple procedure to extract the intruder with a hand magnet; if located in the lens, it may be advisable to leave it undisturbed (as this tissue is very tolerant to foreign substances,) or we may extract the crystalline lens and the foreign body which it contains; if located in the ciliary region and the wound of entrance is of any extent, the situation is almost hopeless and enucleation is usually indicated. The same discouraging outlook obtains when the foreign body is in the vitreous, retina or choroid, whether the foreign body is left in the eye or promptly removed with minimum traumatism. It is a comparatively simple matter to localize a foreign body in the eye and the roentgenologist, skilled in his work, is able to indicate its position within a millimeter or two, so that the ophthalmic surgeon is enabled thereby, to elevate the conjunctiva, make a "T" shaped incision and extract the fragment with a hand magnet. Accurate localization has rendered the hand magnet a valuable appliance and it has almost replaced the giant type. Prior to the present satisfactory methods of localization, the giant magnet was employed to draw the offender into the anterior chamber, but this procedure has been generally abandoned as it was so frequently impossible to dislodge a foreign body or to direct its course into the anterior chamber without its becoming entangled in the ciliary body or iris. As previously stated, whether a foreign body is left within the globe or extracted, the eye will ultimately become soft and atrophic. Foreign bodies located deep in the orbit are frequently not extractable and unless they are in contact with the optic nerve, they can be safely left in position as they are usually harmless. Weekers observation in the army, covering a series of more than eight hundred cases of various wounds of the eye, in which he did not see a single case of sympathetic ophthalmitis, will oblige ophthalmogists to revise their theories concerning the etiology of this condition.

DR. DONALDSON (closing): I appreciate very much the discussion of these gentlemen. There is one point I would like to add for the benefit of those who are perhaps not thoroughly familiar with the difference in tubes. For eye work, avoid the use of soft tubes. They have few penetrating rays. Recently, I had two cases sent in that had a good deal of exposure with soft tubes. There was difficulty in localizing the foreign body. With medium or hard tubes over-exposure of the patient, in order to get a satisfactory result, is not to be expected.

MASTOIDITIS, ACUTE AND SUBACUTE; RESULTS IN A SERIES OF OPERATED CASES*

H. I. Lillie, M. D. and R. A. Barlow, M. D.
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In cases of acute and subacute mastoiditis, operation, in general is indicated to remove the suppurtive process of the bone and to preserve the hearing function. In the presence of a complication such as extension of the suppurative process to the meninges or to the blood through the lateral sinus, the operator is confronted, not with the advisability of entering the mastoid process, but with the responsibility of saving life. Fairly early and complete operation will in a large measure avoid such responsibility. The less immediate serious possibility is the chronically discharging ear now generally considered by the life insurance companies as grounds for rejection of an applicant.

The literature of the last ten years furnishes few reports of series of cases in which operation was instituted in acute or subacute mastoiditis. Two of the more important articles are by Welty and by Borries. From the records in Mygind's clinic in Copenhagen Borries collected 1108 cases in which the total mortality was 10.7 per cent. The operation was considered the cause of 14 of the 119 deaths. Thus the mortality due to operation per se is reduced to 1.4 per cent. Welty reports 106 cases operated on with no loss of life. In his series there were six sinus thromboses, one temperosphenoidal abscess, and three serous meningitis cases. Welty advocates the complete exenteration of the mastoid process. He has not had to reoperate in any of these cases.

The evolution of the operation for mastoid abscess is interesting. Surgical interference has passed through the stage of simply incising the subperiosteal abscess resulting from rupture through the bone, uncovering the bone and breaking off the outer table to allow better drainage, to the now recognizedly advisable procedure of exenterating completely the mas-

*Presented before the Southern Minnesota Medical Association, Rochester, June, 1919.

toid process. Far better results are obtained by the latter method.

The 64 patients in our series of non selected cases were operated on between July 1, 1917 and January 1, 1919.

The age incidence in this series is noteworthy because relatively the same number of cases represented each of the first five decades. The youngest patient was three and one-half months, the oldest seventy-two years. Mastoiditis is evidently not confined to any one period of life.

The trouble in the ear had persisted on an average of four weeks before the patients came for consultation. In forty-four of the 64 cases the abscess in the ear had ruptured spontaneously before the ear had even been examined. In no region of the body has pain with temperature and other symptoms of infection been considered more lightly by the laity and by a great many physicians than pain in the ear. The person with addominal pain and a high temperature lasting but a few hours is very liable to lose his appendix. There seems to be no reason why the suffering of the patient with an abscessed ear should not be relieved early by incision of the drum membrane rather than late by spontaneous rupture. The longer the ear remains undrained the more certain is the development of the surgical mastoiditis. Every physician can and should know when looking into an ear whether the ear should be drained. Bacteriologic examination of the first pus is very important because it often gives warning as to the character of the suppurative process and prepares one to institute operation for thorough drainage of the mastoid at the earliest sign of extension. Disease of the mastoid is not in itself a possibility of great danger, but extension to the meninges or involvement of the blood stream through the lateral sinus are complications which offer grave prognosis, and frequently might be avoided.

The indications for operation in the series of 64 cases were significant:

1. In forty cases the swelling behind the ear pushed the ear outward, tenderness was exquisite, in other words, the cases bore a diagnostic label.

2. In fourteen cases the diagnoses were not definite from a general standpoint but were definite from the ear standpoint. These patients had a history of discharge of several weeks duration without a tendency to subside, pain at night causing more or less insomnia, and general lassitude; in these patients we have found either the lateral sinus or the dura uncovered by the disease process.

3. Ten cases in which the diagnosis was indefinite, from the general standpoint, presented definite evidence of extension of the suppurative process from the ear standpoint.

Two of six patients with sinus thrombosis, required jugular ligation and section; two patients had suppurative meningitis, one patient perisinus abscess with septic nephritis, and one Bezolds abscess of the neck.

What we choose to call the complete mastoid operation, rather than simple mastoidectomy, was used in all the cases, and in none in which the condition was in the acute or subacute stage has it been necessary to reoperate. In one case, that of a young man, a musician with a six months history, the otorrhea did not subside completely. Because the patient had retained very good hearing function, which we wished to preserve, the conservative complete operation was done. This was perhaps faulty judgment on our part. In no case were the findings less extensive than we expected and in most cases they were more serious than we had expected.

The postoperative stay in the hospital of the patients of this series averaged six days. Forty-eight patients had no postoperative incident while in the hospital; those in whom the sinus or meniges were involved had a stormy convalescence. One patient with pleurisy with effusion and a respiration rate of 70 per minute, on whom we operated for sinus thrombosis under local anesthesia, was very ill for three weeks. A boy with a severe septic nephritis and sinus thrombosis was very sick, and under the care of the pediatrist for several weeks. The patients with meningitis died. It is questionable whether they should have been operated on the face of such odds.

The average time for complete healing was 31+ days. By complete healing we mean that the ear is dry and the posterior wound closed.

Surprisingly little posterior deformity resulted in most instances. The open method of dressing was greatly modified so that only the lowermost portion of the wound was allowed to remain open; the upper portion healed by first intention. Four patients were discharged in fifteen days; one, an old lady, for whom dichloramine-T was used with little tendency to repair, was discharged after 128 days.

Two old men developed erysipelas while registered as out patients, one three weeks after operation, the other six weeks after operation; both died. One boy developed smallpox during an epidemic but recovered.

Four patients died, 2 had meningitis prior to operation, and 2 had postoperative erysipelas.

In 3 cases the otorrhea persisted; the disease, however, was really in the chronic state at the time of operation after which the discharge was greatly decreased.

One posterior wound in a boy with a tuberculous process, has not healed completely. He has since had a radical operation but the discharge from the ear continues.

The hearing was improved or remained the same as previous to operation in all but 5 cases. In fact, the hearing function is as good postoperatively as previous to the ear involvement.

Conclusions

1. Early incision of the drum membrane is imperative in inflammatory conditions of the middle ear.

2. In cases of definite mastoiditis operation is indicated reasonably early. The mortality is practically nil in the uncomplicated cases.

3. Preservation of the hearing function is fairly certain.

4. Secondary operation is rarely indicated if the mastoid process is exenterated completely.

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DISCUSSION ON THE JOINT PAPER OF DRS. LILLIE AND BARLOW

DR. J. A. PRATT, Minneapolis: It is very interesting to have had our attention called to the few cases that have required a mastoid operation. In the coming year of influenza infections I think we will have more cases in which it will be necessary to open the mastoid. During the past year at Minneapolis we operated on many cases that presented no mastoid symptoms, but simply a discharging ear following influenza. We made it a point, after four weeks of chornic discharge from the ear following influenza to open the mastoid. In those cases there was no tenderness, no bulging, and practically no pain or other symptoms except a discharging ear, and yet when we opened them we found the mastoid absolutely rotten. These cases looked septic and acted so. We should pay particular attention to these influenza cases as they are likely to get by the general practitioner who first sees them. When a man has a discharging ear that goes on for weeks and does not heal he should take that man to an otologist unless he is capable of caring for the patient himself, because the patient may not have the usual run of classic mastoid symptoms.

The paper was very acceptable in every way. One other point is with reference to running ear and its treatment. I wish to speak of the dry treatment, simply using a dry cotton swab, allowing the swab of cotton to rest next to the drum, filling the canal loosely, and teaching the patient to change the swab every five or ten or fifteen minutes as long as there is a profuse discharge. If this is done, a great many cases will never come to mastoiditis. With the complete drainage we get from the use of the swab, it will enable us to clean up a great many of these cases. If they do not clear up within two or three weeks, if they are not much better, it is well to open the mastoid, and after this a done you will find that these cases get well very rapidly.

TUBERCULOSIS WORK IN RURAL COMMUNITIES*

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Worthington, Minn.

Practically all organized efforts which have been made toward the control and eradication of tuberculosis have been conducted by the cities and the work of stamping the disease out of rural communities has been almost entirely neglected. There seems to be the prevalent idea that tuberculosis is not as common among those residing in rural districts as it is in the cities. This is erroneous for on investigation the disease is found to be proportionally as prevalent in the country. It has always been looked upon more

*Read at the third annual meeting of the Southwestern Minnesota Medical Society, Worthington, Minn., May 8, 1919.

or less as a city disease and apparently there is the general feeling that because one lives in the country where there is an abundance of fresh air and sunshine he can not have tuberculosis. Fresh air and sunshine in abundance will not prevent tuberculosis when not properly used any more than living near a lake will keep clean one who never takes a bath. If those living in the rural districts are going to close all windows and openings through which air may enter and then crowd together in one small room as is often the case, tuberculosis will be as prevalent or more so than in the cities where there is less sunlight and fresh air, but where the residents live under better sanitary conditions in the home.

If the campaign against tuberculosis is going to be a success it will have to be waged in rural communities as well as in the urban, for the need is as great. But it presents a rather more difficult problem; first because many rural districts do not have health organizations; second it is harder to find those suffering from tuberculosis; third they are more difficult to look after when discovered; and fourth there is much to be done along educational lines to eliminate some of the erroneous ideas many have regarding the disease. There is an all too prevalent idea that as long as one suffering from tuberculosis can go around he is not a source of danger. But let this same patient enter a sanatorium and be instructed how to take precautions and then, although he may be perfectly safe to associate with, everyone wants to shun him as being dangerous.

The unwarranted fear of tuberculosis of itself is doing more than anything else to hinder a successful fight against the disease. The careful and conscientious consumptive is not a source of danger when associating with you. It is one who does not know he has the disease or knows it and does not take precautions that should be avoided. There are many (and I am sorry to have to admit, some physicians) who hold up their hands in holy horror when the sanatorium is mentioned and are afraid to come near one for fear of contracting the disease. There is no safer place for one to be as far as the danger of contracting tuberculosis is concerned than the sanatorium. Why should one be so afraid of the sanatorium when he can not show that any employee has ever contracted the disease while working there? If instead of this attitude those who were so afraid would visit a well conducted institution and see how things are taken care of to prevent the spread of infection, I feel that many would be of a very different opinion. The patients are instructed how to cough and allowed to expectorate only in receptacles provided for that purpose, and the eating utensils are sterilized after each meal. The precautions taken make it absolutely safe. Compare this with going into a restaurant and eating with a fork or drinking out of a cup or glass that has been used by an advanced consumptive and only rinsed in warm water, or being in a close and crowded train and having an advanced case cough into your face. This is often done, and many, in their ignorance, seem to prefer it rather than be where they are protected. Think of the cases of tuberculosis on the streets that are uncared for and who are exposing others simply because they don't take precautions. A few common sense reflections would be a great help to many and if the truth could be instilled into every one, the tuberculosis problem would soon assume a very different aspect from the one we confront at the present time. The campaign in order to be a success will have to be conducted along educational lines. Many of the present ideas regarding the disease will have to be removed and others instilled into the mind of the average individual. Tuberculosis is preventable and curable. In order to prevent it the open cases which spread infection must be found and either made to enter a sanatorium or to observe the rules of sanitation in the home.

Now that we have tuberculosis in the rural districts and this is a rural community with its full amount of tuberculosis, something must be done to overcome it if possible. Probably there is no more typical rural community than that of Southwestern Minnesota. It is the richest farming section in the state; still, it has tuberculosis. One should need no better proof of this than the fact that although the Southwestern Minnesota Sanatorium which takes care of patients from this section has been open only one month it is nearly filled with patients and at the rate they are being admitted it will soon have a waiting list.

To successfully handle the tuberculosis prob-

lem in any place it is necessary to make an organized effort and do the work in a systematic way. The result will depend greatly on the co-operation and assistance the general practitioner gives, for he is in a position to be one of the most important cogs in the wheel of success. He is the one who most often first sees the patient and whose council and advice the patient is most apt to follow. His position is such that the success of the campaign will depend as much on him as any other one factor, and without his aid and assistance it will be a failure. It would seem that every one would be willing to lend his aid not only that suffering might be lessened, but that he and his family might be protected.

The work should be directed along preventive lines as well as that of caring for active cases of tuberculosis. If infection can be prevented the disease will not develop. In order to prevent infection its source must be eliminated; in order to eliminate the source it must be found; in order to do this every open case of tuberculosis must be located. This is the important thing in a campaign and a big undertaking. This is the hardest part of the fight against the disease. It is not expected that every case in the community can be found at once, but every effort should be made to find them. They will not be found if they are not looked for, and when they are looked for, many will be found which were not suspected. These should be found and either cared for in the sanatorium or made to observe the rules of sanitation in the home. The sanatorium is the training school for the tuberculous and if every case could be gotten into such an insitution as soon as possible after the disease begins, he could be instructed how to take precautions to prevent its spread and could also be given an excellent chance to regain his health. The work a sanatorium does in the way of teaching the tuberculous how to take precautions and thus protect others is well worth what it costs, even if none of the patients were restored to health. The results obtained in restoring patients to health will depend largely on the condition of the patient on admission; if an early case the chances for recovery are excellent. The sanatorium can not restore the far advanced case to good health any more than a house that is practically destroyed by fire can be restored to its former condition by turning on the hose. The fire department can prevent the spread to the other houses and thus save them. The same is true of the sanatorium; it may not be able to save the individual but it can protect others.

As stated above the first and most important thing is to find all open cases of tuberculosis and have them properly taken care of either in the home or sanatorium. If we stopped here the work would be incomplete. When a case of tuberculosis has been found, everyone with whom he has been in close contact should be carefully examined. It is now known that childhood is the period of life when the danger of infection is greatest and any child known to have been exposed through contact with an open case should be periodically examined regardless of apparent good health. This might appear at first thought a stupendous undertaking and one impossible of accomplishing, but it is the only way to successfully combat the disease. When the consumptive has been taken out of the home its condition should be looked after and the other members of the family instructed in how to live to prevent the disease from developing. In order to do this successfully it will be necessary to have the assistance of a nurse. Right here I would like to say a well trained visiting nurse is one of the most important agents in the successful handling of the tuberculosis problem. She can be of immense help to the family physician and can often accomplish things with the family he could not spare the time to do. It can be readily seen that if the fight against tuberculosis is to be a success, co-operation will be of the greatest importance. The general practitioner may find the case but will need the sanatorium or nurse to help care for it and see that the other members of the family are properly looked after. The nurse can accomplish more in instructing the patient how to take precautions and to see that the proper conditions exist in the home than the physician, simply because she can give more time to the work. The sanatorium offers the best chance to the patient for recovery and can better teach him to take precautions how to prevent the spread of disease.

To wage a successful fight against tuberculosis in any community the following agents are necessary:

1. A sanatorium, well equipped and provided with a capble staff of physicians and nurses.

2. A visiting nurse or nurses as necessity demands.

3. The interest and co-operation of the medical profession.

4. The education of the public in the right direction regarding tuberculosis by means of County Health Organizatons or other organizations which may be interested. Every community should have a County Public Health Association, and I trust the physicians may use their influence to bring about such an organization in their respective counties.

I don't wish to be misunderstood and leave the impression that every case should be hurried off to the sanatorium as soon as found, for that is not my idea. The sanatorium is the place to get the best results in a majority of cases, but there are some not suited for sanatorium treatment. Each case should be handled individually. When the sanatorium is the place for a particular patient, he should be placed there. When he can be successfully handled in the home and wants to be there, his wishes should be considered. The sanatorium should be the base from which all the tuberculosis work of the community is directed. It should be able to care for those cases needing sanatorium treatment; to provide physicians to conduct clinics and examine patients, and furnish visiting nurses to give instruction in the homes and help the family physician look after cases that remain at home.

The visiting nurse is of immense value in educating the public and can be of valuable assistance to the physician in helping him take care of the case and instructing the other members of the family. She can hunt up suspected cases and urge them to be examined by the family physician or come to the clinics and be examined by one of the sanatorium physicians. She should visit all homes where there has been a case of tuberculosis and see that the proper precautions are being taken. A complete record of the home conditions should be made. It is also highly important to have her visit the patients who have been discharged from the sanatorium to see that they are living the kind of life necessary to prevent a future breakdown. An ex-sanatorium patient is very much like a mischievous child and is on his best behavior if he knows he is being watched. The work of following up all discharged patients is highly important for in this way the real value of the sanatorium can be ascertained.

In order to get the best results I feel that all cases should be reported to the sanatorium as soon as found. A visiting nurse should then call on the physician who can engage her services in instructing the patient in the home and looking after the welfare of other members of the family or else use her influence in getting the patient to enter the sanatorium. She should keep a careful record of the case, showing the patient's attitude, willingness to co-operate, condition of the home, number exposed and recording the advice given.

Every means possible should be used to educate the public to the real truth regarding the disease, its curability, its prevention, etc.

With all of the above agencies working in harmony most of the cases of tuberculosis could be found and carefully looked after. When this has been accomplished the death rate from the disease will rapidly decline.

This community has the sanatorium; a visiting nurse is employed by the sanatorium and others will be added as need demands. I believe the physicians of southwestern Minnesota are going to be interested in doing what they can to eliminate tuberculosis. For the interest already shown would indicate this. The machinery is here, it is only necessary to put it to work to accomplish the desired results. The Southwestern Minnesota Sanatorium is the best constructed and equipped of any institution of its kind in the United States serving strictly a rural community. I say this without fear of having the statement challenged. With your support and co-operation the work of eradicating tuberculosis in southwestern Minnesota will be as successful as in any community of our country. Will you give your support and let others see what can be accomplished toward wiping out tuberculosis in rural communities?

ORGANIZATION OF MILITARY HOSPITALS; GENERAL CONSIDERATIONS WITH REFERENCE TO THE TREATMENT OF WAR WOUNDS

By Antoine De Page, M. D.,
LaPanne, Belgium,
Surgeon-General of the Belgium Army.

In organizing our hospital at LaPanne there were three points we kept clearly in mind: first, rapidity of the treatment; second, continuity of treatment; and third a close association of the laboratory with the surgical work.

As regards the rapidity of treatment, in the beginning of the war the hospitals were situated from forty to fifty miles behind the lines, and the wounded soldiers brought to the hospitals were in an awful condition. We than began to establish hospitals about six miles behind the lines, so that it was possible to get the wounded soldiers in, from four to eight hours. This change resulted in great progress, but this was not enough for abdominal and chest cases and cases of emergency. Therefore, we established advance posts a little behind the lines where they could deal with abdominal and chest wounds, and by so doing we were enabled to reduce the mortality of abdominal and chest wounds from 65 to 45 per cent.

With reference to the continuity of the treatment, the wounded men were treated by the same surgeons until absolutely cured. In order to carry this out, the hospitals were enlarged as much as possible, and to give you an example, all the nerve cases or injuries that passed through our hospital were kept under observation and under my control from the time they were received until they were operated, and even after operation they were still under my control.

As to the close association of the laboratory work with the surgical work, it is not necessary for me to say much about that phase of the subject because you see here in the Mayo Clinic the value and great importance of that.

As to the progress made in the general treatment of war wounds, one of the most interesting things is the secondary closure of infected wounds. Secondary suture of wounds after infection enables us to cure a man within two or three weeks, and this is especially interesting when we come to consider open fractures. Formerly, in cases of open fractures, it used to take six or seven months before a complete cure was effected. At the present time, by secondary suture after infection, these fracture cases are cured after two or three months. Furthermore, at the beginning of the war, when we did not make secondary suture, only five per cent of the men who sustained fractures of the femur were sent back to the front, but since we have been resorting to secondary suture in cases of fracture of the femur, 50 per cent of the men have been sent back to the front.

In the matter of amputations great progress has been made. We do not pay as much attention to the flap as we formerly did, but it is important to secure as good a stump as possible for the application of an artificial limb.

Progress has also been made in the treatment of injuries of the knee joint. In the first period of the war, or until July, 1916, all our knee joint injuries were infected. During the second period, from July, 1916, to July, 1917, we used the Carrel-Dakin method of treatment in cases of infected joints and our results were much better. In the third period we resorted to primary suture of the joints. As soon as the patient came in the joint was opened, the foreign body was removed, the lacerated tissue excised, and the joint sutured immediately. In those joints in which there was no injury to the bone, which we treated in this way, 96 per cent healed by first intention; only 4 per cent became infected. In joints where there was at the same time injury to the bone, and which we treated by primary suture, 89 per cent healed by first intention; 11 per cent became infected. Then, after inaugurating the Willms method of treating infected joints, practically all joints healed by first intention. Willms method consists in making a double arthrotomy in cases of infected joints, and then have the patients make active motions.

With regard to the wounds of the chest, in the beginning of the war, when there was not

Read Before the Southern Minnesota Medical Association at Rochester, June 23-24, 1919.

much activity displayed in operating on these cases, 27 per cent of the patients with chest wounds died. Later on the results were much better because operations were more frequently done. Operation consisted in closing immediately open hemothorax; if there was bleeding, by stopping the hemorrhage from entering the pleural cavity. If a foreign body remains in the chest and gives no trouble, it is localized. If the foreign body causes trouble, an effort should be made to extract it. If a chronic empyema develops later there is no need of doing an Estlander or Schede operation; we can sterilize the cavity by the Carrel treatment and make a secondary suture of the wound.

To determine better the moment most favorable for suture, we have supplemented the counting of the microbes on the smears subjected to bacteriological examination by cultures instituted regularly after debridement and before the suture, and conclude that: (a) for wounds feebly infected from the first day with ordinary microbes we may proceed to suture when at the second examination a smear yields only one microbe in a visual field. (b) For wounds strongly infected by ordinary microbes, we may resort to suture from the moment the curve comes down to one microbe in four fields. (c) For streptococcus infection we should never suture, but submit the wound to adequate treatment, preferably that of Carrel, and wait until the streptococci have disappeared, or become sufficiently attenuated to permit primary union. Streptococci vaccination may here render the greatest service. Immediate primary suture may be made immediately after debridement or from two to four days after debridement. Delayed primary suture or early secondary suture is done without refreshing the wound surfaces, by simply approximating them. The suture may be made in the course of the granulation of the wound when sterilization is assured. Secondary suture always necessitates the refreshing of the wound surfaces. The objective towards which we direct the surgical treatment of open fractures, apart from the orthopedic treatment, is the transformation of an open fracture into a closed fracture. In joint wounds our results show the superiority of immediate suture, closing the joint cavity after wide arthrotomy, over any other method of treatment. In wounds of the elbow and shoulder, however, the Carrel treatment followed by secondary suture or by cicatrization by second intention is evidently indicated.

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EDITORIAL

AMERICAN INTELLIGENCE

We consider ourselves particularly fortunate in being able to offer our readers the paper entitled The Measure of Mentality by Dr. Sweeney. While not on a strictly medical subject, the paper should be interesting to everybody and particularly at this time in our national history. The views of the author on the various practical applications of the method of measuring intellect will naturally call forth considerable discussion. Some of these applications will undoubtedly be adopted in time but as the author points out, progress in general is a very slow process.

While the author lays stress on the fact that the Binet psychological test is primarily a test of inborn intelligence it would be disheartening to believe that our lives are as largely dependent on our inherited make-up as the author implies. Just as his figures show that illiterates and foreigners are rated in larger percentage below the average and below those better educated, we are encouraged to believe that education and study may largely overcome natural mental handicap. Of course it must be considered that the converse is undoubtedly true, namely that the more native intelligence an individual has the easier education is acquired. Naturally then, the better educated an individual, the higher he would be rated in an intelligence test.

It is appalling to think that the average adult has a mental age of twelve. Would it not be truer to state the converse of this—that the average adult is rated at the age 12 by this system. The proposition is not so discouraging when we realize that the adult cannot be rated above 16 to 18 years.

The opinion has been expressed by some who have observed how the intelligence tests were conducted at the various camps, that conclusions based on reports of the army psychiatric examiners must be formed with reservations. The mental response of the new recruit, in certain sections of the country, drafted largely from rural districts, whence he had been rudely summoned by the call to arms, must be justly allowed for. He was roughly put through the mill, examined, vaccinated, inoculated, reprimanded at every turn for failure to act the soldier, and then herded into a room with a lot of others to have his intelligence tested. In many cases the test was conducted by a non-com. Is it to be wondered that in many cases he was completely flabbergasted, and rated low in the scale?

Further light has been thrown on the work of the psychiatric examiners by Dr. Ball in a paper recently read before the State Medical Association in Minneapolis.

Dr. Bailey, in an address given before the Minnesota Neurological Society also called attention to the large number of nervous and mental defectives in the recent draft. He stated that there were 40,000 men discharged from the United States Army because of nervous and mental conditions, a number equivalent to such defectives in the states of Massachusets and New York. This figure does not include those rejected by the draft boards. Of the 40,000, 10,000 were discharged for psychiatric incompetency. Only 3 per cent of the total number were alcoholic addicts, a surprisingly small per cent, and an equal percent was discharged for drug addiction.

Intelligence of course is not the all important factor in a man's mental make up. The qualities of judgment dependent on education and experience, and moral qualities so dependent on training and environment are fully as important in the make up of a good citizen as pure intelligence. A man who measures up to age 12 and yet has adult judgment is a more

desirable citizen than a clever crook rated among the uppermost 15 per cent.

It would undoubtedly be well to try out candidates for higher education with a psychological test. It would also be well to consider other mental qualities at the same time. No systems of examination of moral qualities or mental balance have as yet been discovered but these qualities could very well be considered in selecting candidates for various callings.

Along with higher education today as President Hadley of Yale pointed out in his recent matricultion sermon, should go a kind of education not simply cultural, not simply vocational but one that trains the individual to judge and choose the things relatively most worth while from a moral standpoint.

As the author points out, where the most intelligent individuals in a community who as a rule compose the governing and influential group, have good moral qualities and by this is meant the Christian ideals of sacrifice of personal interest for the other fellow, individually or in groups, happy is that community. If these moral qualities are lacking what is to prevent exploitation of the less intelligent?

Thus the importance of moral training in home and school and this training should be according to the very best moral teaching we know—the Christian.

We cannot but deplore the view point so often expressed, of the justice of each man acquiring all of this world's goods he can—that is, that his intelligence will allow him. Has the man then who knows how to obtain a monopoly the right to his millions? It is just this lack of moral tempering in the most intelligent and ruling class that causes much of a justifiable social unrest which is in evidence so strongly today and which threatens even the countries with a longer standing experience with democracy.

THE CHIROPRACTIC ACT

Chiropractic is a name given to the study and application of a universal philosophy of biology, theology, theosophy, health, disease, death, the science of the cause of disease and art of permitting the restoration of the triune of relationships between all attributes necessary to normal composite forms; to harmonious qualities and equalities by placing in juxtaposition the abnormal concrete positions of definite mechanical portions with each other, by hand; thus correcting all subluxations of the spine, atlas to coccyx inclusive, for the purpose of permitting the currents, through nerves that were formerly not permitted to be transmitted, through impingement, but have now assumed their normal size and capacity for conduction as they emanate through intervertebral foramina—the expressions of which were formerly exeessive or partly lacking-named disease.

Now we know what Chiropractic is. The definition is given by the promoter of the art and science and so must be reliable. What an absurd attempt to make an impression through this hyperbolic definition of what claims to be, not simply an art and science but a universal philosophy of theology.

When one considers that the entire practice is founded on the assumption merely that spinal nerves are impinged as they pass through the intervertebral foramina, not sufficiently to cause areas of paralysis or disturbed sensation but just enough to interfere with those "currents of cycles of mental impulses," there seems to be little if any excuse for its existence.

The whole proposition is the more absurd in that the attempt is made to palpate slight subluxations of the vertebrae—in many cases the smallest fraction of an inch and then—mirabile dictu—the attempt is actually made to relieve the pressure by correcting through manipulation the supposed minute deformity.

Orthopedics recognizes the importance of correct posture, particularly as applied to the spine. Physiology recognizes the importance of nerve impulses to the entire body. But where is there sufficient proof of this impingement theory to warrant such a concentration upon this alleged common abnormality.

And yet there are over 9,000 chiropractors in the United States and over 1,300 students enrolled annually. And all this has developed practically since the year 1903 when B. J. Palmer, D. C., Ph. C., the son of Dr. D. D. Palmer the original Chiropractor, began to spread the doctrine.

Minnesota has recently followed the questionable example of Connecticut, Nebraska, Kansas, North Dakota, Oregon, Arkansas and New

York and passed a bill recognizing and licensing chiropractors.

There is nothing in the bill definitely barring from practice the host of individuals who, with no educational ground work have taken a short course in chiropractice of one to three months and are masquerading as doctors. They apparently will all be licensed providing they have practiced for a period of six months.

Although therapeutically, these doctors may limit themselves to the spinal nerves, they are diagnosing and caring for a variety of diseases. Our vital statistics are of much less value, now that death certificates are being signed by D. Cs.

It is considered by some that it is beneficial for asses to lie down and roll. Next we will have a bill licensing The Holy Rollers.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA ACADEMY OF MEDICINE. NOVEMBER MEETING, 1919.

After the usual dinner the members assembled in the grill-room of this club for the third meeting of the year. Dr. H. B. Sweetser presided. The minutes of the last meeting were read and approved.

Three clinical cases were reported by Dr. Farr, after which the retiring president, Dr. Christison, gave his address. The Medical Aspects of School Life, with special Reference to Work accomplished among Defective Pupils, was the theme he chose to discuss.

Dr. E. L. Gardner followed with his inaugural thesis, A Clinical Study of Basal Metabolism.

Twenty-three members and two visitors were in attendance.

DR. FARR'S CASES.

One was of a boy nine years old who was struck by the fender of an automobile and seriously hurt. The accident occurred at noon; no external marks of injury. The boy was dazed and unable to walk, however. Two hours later he was seen again by a physician who pronounced the injury not serious. At 8 o'clock that evening he grew suddenly pale. A physician was called and the boy taken to the hospital immediately. Dr. Farr did not see him until eleven. The pulse was gone, the pupils dilated, and the patient gasping for air. Apparently he was dying. Taken to the operating room, he was surrounded with heat and give 300 c. c. of blood at once, without stopping to test the donor. 900 c. c. of normal saline was also given. Meanwhile the abdomen was opened under novocaine and search made for the lesion. Much blood escaped from the cavity, and it was only after considerable time that the point of injury was located. It proved to be a rupture of the liver, extending into the peritoneal cavity. The wound was packed with gauze and the abdomen rapidly closed. Before the operation was over the pulse became perceptible and at the end was fairly strong. Two assistants and the donor remained at the hospital and were called upon to tranfuse 300 c. c. more blood during the night. Seven days later (at the time of this report) the boy was doing well.

The second case was that of a woman on whom Dr. Farr performed hysterectomy and appendectomy twelve years before. She entered the hospital early in November, complaining of great tenderness in the right side of the abdomen. Much distended; pulse, 120; temperature, 102; leucocytes, 7,200. The X-ray showed no free gas in the peritoneal cavity. Probable diagnosis, perforation of a typhoid ulcer. Under novocaine, the abdomen was opened through a McArthur incision and the cecal region explored. The trouble was found to be due to a heavy band of adhesions which obstructed the ascending colon. The adhesions were divided and the abdomen closed. Pain was entirely relieved, the bowels acted freely in a few hours, and the patient made a good recovery.

A third case was that of a man 84 years old who complained of urinary retention and periodic pain in the region of the bladder. Prostatic obstruction was diagnosed and a suprapubic cystotomy performed. The bladder was found completely filled with small stones, resembling in size and shape puffed rice. There were as many as 1,200 or 1,500 of them. In fact the bladder wall was so studded with them that it was impossible to say if they were all removed. Only the central lobe of the prostate was excised. The defect was closed over with mucous membrane and a tube left in for drainage.

—F. E. LEAVITT.
Secretary.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY.

The 34th annual meeting of the South Western Minnesota Medical Society met at Luverne November 13th.

The meeting was called to order by the Vice President, Dr. E. G. McKeowen of Pipestone. There was a fairly good attendance and a most interesting program.

The following officers were elected for the ensuing year.

President, Dr. E. G. McKeowen, Pipestone, Minn.

Vice President, Dr. F. W. Metcalf, Fulda, Minn.

Secretary, Treasurer, Dr. F. G. Watson, Worthington, Minn.

Dr. F. R. Weiser, was re-elected Censor for three years from Cottonwood County.

Dr. L. A. Williams, Censor for three years from Murray County.

Two Minneapolis physicians presented very interesting papers, Dr. John O. Taft on "Syphilis" and Dr. Max Seham on "Differential Diagnosis" of Heart Murmurs in Children."

Dr. J. G. Parsons of Sioux Falls read a very practical paper on The Running Ear.

State Sanitary Conference, Lowry Building, St. Paul, Minn., Dec. 9th, 1919.

The following is the program of subjects which were informally discussed by the County Health Officer, who suggested the subject, and others present:

The Control of Venereal Diseases in Country Districts. Suggested by Dr. L. Soggee, Cottonwood County. Discussion by Dr. H. G. Irvine, Director, Div. of Venereal Diseases.

Securing Municipal Sanitary Regulations and Ordinances. Suggested by Dr. F. M. Smersh, Steele County.

The Annual Spring Clean Up—as a Medical Officer's Duty. Suggested by Dr. L. N. Klove, Health Officer.

County and Local Health Officers—Appointment, Duties and Cempensation. Suggested by Dr. H. M. Workman, Health Officer. Dr. J. M. Rains, Health Officer. Discussed by Dr. E. H. Bayley, Wabasha County, Dr. B. F. Van Valkenburg, Health Officer.

The County as a Health Unit. Suggested by L. W. Feezer. Discussed by Dr. J. E. Rheim, Kanabec County.

Disinfection. Suggested by Dr. A. M. Ridgway, Wright County. Discussed by Dr. E. H. Bayley, Wabasha County.

Compulsory Care of Tuberculosis. Suggested by Dorothy Motl, Red Cross Nurse. Discussed by Josephine Creelman, R. N. Extension Div. U. of M. Dr. S. L. Leonard, Redwood County; Elizabeth Sprague, Div. of Tuberculosis, Mpls.

Control of and Expenses of Control of Communicable Diseases. Suggested by O. W. Anderson, County Auditor, Travers County. Discussed by O. C. Pierson, State Board of Health; Dr. H. W. Hill, Ex. Sec. Minn. State Public Health Ass'n.

Control of Communicable Diseases in Schools—Powers and Duties of Local Board of Health and Boards of Education. Suggested by Dr. E. A. Shannon, Health Officer. Discussed by Dr. E. H. Bayley, Wabasha County; Emma Bunge, Visiting Nurse.

The County, Municipal and School Nurse. Suggested by Frances V. Brink, Supt. of State Nurses. Discussed by Anna Weum, Dept. of Nursing N. D. Red Cross; Emma Rood, Northern Div. Red Cross; Josephine Creelman, Extension Div. U. of Minn.

The Control of Diphtheria Carriers. Suggested by Dr. H. C. Doms, Murray County.

The Municipal Milk Problem. Suggested by Dorothy Motl, Public Health Nurse. Discussed by Dr. W. F. Bleisfuss, Rochester.

Stream Pollution. Suggested by H. A. Whittaker, Director, Div. of Sanitation.

The following officers were elected for the ensuing year: president, Dr. W. F. Bleisfuss, Health Officer, Rochester; vice president, Dr. G. E. Page, Health Officer, Sherburne county; secretary, Dr. C. E. Smith, Jr., Executive Secretary of State Board of Health.

This State Sanitary Conference is primarily a conference of the county health officers, which is provided for by law. All those interested in public health activity including particularly all city health officers and public health nurses are invited to attend the annual meeting.

At the meeting held Dec. 9th, 1919, a committee composed of Dr. E. H. Bayley, Wabasha county; Dr. M. M. Hauge, Yellow Medicine county and Dr. B. Van Valkenburg, Todd county, all County Health Officers was appointed to make a report at the next conference regarding legislation with the view of adopting the county instead of the township or city as the public health unit and employing the services of a full time physician for each county or group of counties.

TWENTY-FOURTH SEMI-ANNUAL SESSION OF THE SIOUX VALLEY MEDICAL ASSOCIATION

Sioux City, Iowa.

Wednesday and Thursday, January 21 and 22, 1920.

Headquarters and Sessions at Hotel Martin

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PROGRAM

Wednesday, January 21, 1920

Morning Session, 9:00 o'clock

Calling of the meeting to order by the Chairman of the Committee of Arrangements.
Reading of the minutes of the previous Meeting.
Report of the Committee of Arrangements.
Report of the Treasurer and Standing Committees.
New Business.

PRESENTATION OF PAPERS

J. E. Reeder, M. D., Sioux City, Iowa—"Epidemic Mastoiditis."

R. M. Waters, M. D., Sioux City, Iowa—"Accidents During Anaesthesia."

C. R. Mullong, M. D., Norfolk, Nebr.—"Blood Transfusion and the Results that may be Expected."

Albert F. Tyler, M. D., Omaha, Nebr.—"The Injection of Gas into the Peritoneal Cavity for Diagnosic and Therapeutic Purposes."

F. S. Clark, M. O., Omaha, Nebr.—"Results of Some Experimental Work with the use of Sodium Cacodylate on Athreptic Infants."

Wednesday, January 21, 1920
Afternoon Session, 1:30 o'clock

Edward M. Williams, M. D., Sioux City, Iowa.—"Consideration of Endocrine Influences."

D. T. Quigley, M. D., Omaha, Nebr.—"Etiology of Cancer."

G. G. Cottam, M. D., Sioux Falls, S. D.—"The Problem of the Infirm Prostatic."

J. E. Summers, M. D., Omaha, Nebr.—"The Acute Abdomen, with Special Reference to Intestinal Obstruction."

Samuel C. Plummer, M. D., Chicago, Ill.—"Surgical Shock."

J. P. Lord, M. D., Omaha, Nebr.—"The Preservation of Function in Joints after Fractures."

F. J. McAllister, M. D., Hawarden, Iowa.—"Wound Repair."

Wednesday, January 21, 1920
7:00 P. M.

Banquet at Hotel Martin followed by addresses.

Colonel P. M. Culler, M. C., U. S. A., Hot Springs, Arkansas—"Medical Memories of the War."

Donald Macrae, Jr., M. D., (Late Colonel, M. C., U. S. A.) Council Bluffs, Iowa—"Who Won the War."

Followed by toasts and addresses by other prominent members of the profession.

Thursday, January 22, 1920
Morning Session, 9:00 o'clock

R. F. Bellaire, M. D., Sioux City, Iowa—"Value of the Fluoroscope in Gastro-Intestinal Diagnosis." Illustrated by lantern slides.

F. J. Plondke, M. D., St. Paul, Minn.—"Vaginal Drainage." Illustrated by lantern slides.

W. H. Mick, M. D., Omaha, Nebr.—"Similarity of Emergency and Military Roentgenology."

W. E. Wolcott, M. D., Omaha, Nebr.—"X-Ray Interpretation of Bone and Joint Pathology." Illustrated by lantern slides.

E. G. McKeon, M. D., Pipestone, Minn.—"Unusual Case."

Thursday, January 22, 1920
Afternoon Session, 1:30 o'clock

G. C. Moorehead, M. D., Ida Grove, Iowa.—"Head Colds."

J. P. Dougherty, M. D., Sioux City, Iowa—"The Polya Operation with Report of Case."

J. G. Parsons, M. D., Sioux Falls, S. D.—"Myasthenia Gravis."

J. C. Hay, M. D., Laurel, Nebr.—"Diagnosis and Obstetrical Management of Breech Delivery."

The original stethoscope was devised by Laennec a Frenchman and consisted of a hollow wooden tube. He conceived the idea while watching some children playing in the gardens of Louvre listening to the transmission of sound along pieces of wood.

As we know any kind of stethoscope simply excludes extraneous sounds while providing a column of air for the transmission of vibrations.

The old type mon-aural wooden stethoscope is still largely used in European clinics. It is particularly adapted to the auscultation of fetal heart sounds but is lacking for general use because of its shape, and because both ears are not used.

OF GENERAL INTEREST

Dr. Edward Ohare of Milroy has located in Watkins.

Dr. G. L. Atkins of Estherville, Iowa will locate in Jackson.

Dr. Walter Halloran of St. Paul has located at Jackson.

Dr. John Abbott has moved to 846 Lowry Bldg., St. Paul.

Dr. W. F. Cobb formerly of Lyle has moved to Northfield.

Dr. H. E. McKibben formerly of Hector has located in St. Cloud.

Dr. Stewart Anderson, who recently returned from service has located at Wells.

Dr. H. J. Shelver of Appleton is taking a post graduate course in Chicago.

Dr. W. J. Kucera, recently discharged from the army has located at Hopkins.

Dr. C. M. Robilliard of Faribault is taking a post graduate course in New York.

Dr. J. J. Donovan has returned from service in France and has returned to Litchfield.

Dr. A. E. Amundsen of St. Paul has associated himself with Dr. E. E. Hall of Little Falls.

Dr. Harry Brown of Duluth will move to Bowerville and be associated with Dr. Gardner.

Dr. O. H. Urstad has sold his practice and hospital to Dr. Arthur Henderson of Minneapolis.

Dr. G. A. Larsen will move to Minnesota and be associated with Drs. F. M. and J. F. Smersh.

Dr. and Mrs. E. P. Hawkins of Montrose have gone to Florida where they will spend the winter.

Dr. E. G. Nylander of Maiden Rock, Wis., has associated himself with Dr. N. A. Nelson of Dawson

Clarissa, Minn. wants a good Doctor, Dentist and a Pharmacist to locate there. Write Frank Fimon at Clarissa.

Dr. M. C. Guthrie is now district supervisor of the United States Public Health Service at 744 Lowry Bldg., St. Paul.

Dr. H. W. Meyerding will be away from the Mayo Clinic for about a month on a clinical trip to Boston and New York.

Dr. Frank W. Spicer has announced his return from the army and has resumed practice at 500 Fidelity Bldg., Minneapolis.

Dr. J. F. Avery has returned from service in the army and has resumed his practice at 1020 Donaldson Bldg., Minneapolis.

Dr. Russell Wilder of Chicago has accepted a position in the Mayo Clinic as an associate in the Division of General Medicine.

The Faribault Clinic was formerly opened No-

vember 1st by Drs. W. H. Rumpf, F. U. Davis, C. J. Plonske, C. M. Robilliard and W. H. Robilliard.

Dr. L. M. Boyd of Alexandria has returned from service in the army and has resumed his practice which is limited to eye, ear, nose and throat.

Dr. J. C. Michael has resumed civil practice and announces the opening of his offices at 527 La Salle Bldg., Minneapolis. He will limit his practice to nervous and mental diseases.

Dr. Thomas Magath, recently an instructor in anatomy in the College of Medicine of the University of Illinois has gone to the Mayo Clinic as assistant in parasitology and bacteriology.

Dr. Hempstead, who left the Mayo Clinic last April after working in Dr. Lillie's section for about a year, has returned as a member of the permanent staff in the section on Ear, Nose and Throat.

Thru an error the Necrology report of the Minnesota State Medical Association reported the death of Dr. C. M. Oberg of Minneapolis. Dr. Oberg's name was confused with that of Dr. C. Oberg a former dentist of Minneapolis.

Dr. Geo. W. Beach, formerly superintendent of the Minnesota State Sanitorium, Cass County, Minnesota, and recently returned from army service has been appointed Chief of Medical Activities under the Serbian Relief Committee of American.

A laboratory position preferably with some doctor in the Twin Cities is desired by Miss Jessie Porter, B. A., 1636 Thomas St., St. Paul. Laboratory training in the technique of blood and urine examination and in basal metabolism has been had at the University Hospital.

Dr. H. H. Holm, formerly assistant City Physician of Minneapolis, has associated himself in the practice of medicine and surgery with Dr. O. G. R. Freed of Cokato. Drs. Freed and Holm have purchased the Cokato Hospital and will conduct a nurses training school under the direction of Miss Blanche Rucker, R. N. the Superintendent.

Captain Everett C. Hartly of Carver, Minn., is chief of the American Red Cross Unit at the large refugee camp at Baranowizce in Poland. This camp is doing important work in caring for refugees sick with contagious diseases and who are now returning in large numbers to Poland. The hospital and disinfecting plants play an important part in helping to combat epidemic disease such as typhus, cholera and dysentery, which are playing such havoc in this part of Poland.

Dr. Hartly reports some alleviation of the situation accompanying the recent much needed improvement in his hospital equipment.

The members of the Association of the Resident and Ex-resident Physicians of the Mayo Clinic at a business meeting, Wednesday afternoon, October 8th, elected the following officers: President, Dr. C. G. Toland, Los Angeles, Cal.; vice-president, Dr. Guy Aud, Louisville, Ky.; secretary, Dr. H. L. Foss, Danville, Pa.; treasurer, Dr. A. H. Sanford, Rochester, Minn.; board of governors, Dr. W. F. Braasch, Dr. E. S. Judd and Dr. D. C. Balfour.

NEW AND NON-OFFICIAL REMEDIES

During November the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion with New and Nonofficial Remedies:

Nonproprietary Articles:
Neocinchophen.

Calco Chemical Company:
Neocinchophen-Calco.

Hollister-Wilson Laboratory:
PITUITARY SOLUTION-Hollister- Wilson.
Ampules Pituitary Solution-Hollister-Wilson.

Pure Gluten Food Co.:
Hoyt's Gluten Special Flour.

Van Dyk and Company:
Benzyl Benzoate for Therapeutic Use—Van Dyk and Co.

Winthrop Chemical Co.:
LUMINAL.
Luminal Sodium.
Luminal Tablets.

Albutannin—Tannin Albuminate Exsiccated.—A compound of tannin and albumin, thoroughly exsiccated and containing about 50 per cent of tannic acid in combination. It was first introduced as tannalbin. The use of albutannin is based on the assumption that the tannin compound passes the stomach largely unchanged and thus the astringent action will be exercised in the intestine where the compound will be decomposed by the intestinal fluid, slowly liberating the tannic acid. Albutannin is used in diarrhea, particularly in that of children, and in phthisis.

Albutannin-Calco.—A nonproprietary brand complying with the standards for albutannin. The Calco Chemical Co., New York.

Albutannin-Merck.—Merck and Co. have adopted the name albutannin for the product accepted as tannin albuminate exsiccated—Merck (see Supplement to New and Nonofficial Remedies, 1919, p. 12) (Jour. A. M. A., Nov. 1, 1919, p. 1363.)

Acetannin—Tannyl Acetate.—The acetic acid ester of tannin.—Acetannin was first introduced as tannigen. Acetannin is claimed to be practically nonirritant to the stomach and to pass unchanged into the intestine, there to become effective as an astrigent. It is used in diarrheal affections.

Acetannin-Calco.—A brand of acetannin complying with the standards of New and Nonofficial Remedies. The Calco Chemical Co., New York.

Antipneumococcic Serum, Combined Types I, II and III-Gilliland.—Prepared by immunizing horses

with dead and living pneumococci of the three fixed types and standardized against Type I culture. Marketed in 50 Cc. gravity injecting packages and also in 50 Cc. and 100 Cc. vial packages. The Gilliland Laboratories, Ambler, Pa. (Jour. A. M. A., Nov. 8, 1919, p. 1442.)

Tablets Cinchophen-Abbott, 7½ Grains.—Each tablet contains 7½ grains of cinchophen-Abbott. Cinchophen was first introduced as atophan and is in the U. S. Pharmacopeia as Acidum phenylcinchoninicum. The Abbott Laboratories, Chicago.

Acriflavine and Proflavine.—These are dyes derived from acridine, a base found in coal tar. Their use in medicine is proposed on the claim that they have high antiseptic power, together with comparative freedom from toxic or irritant action and without inhabiting effect on the phagocytic action of leukocytes or on the healing process. They have been used as wound antiseptics, and acriflavine has also been proposed for the treatment of gonorrhea. The reports on the value of the two preparations are contradictory and conflicting. In the treatment of wounds, solutions of 1:1,000 in physiologic sodium chloride solution are commonly recommended. In gonorrhea, a strength of 1:1,000 in physiologic sodium chloride solution is used for an injection into the urethra, and weaker solutions have been used for lavation.

Acriflavine.—This is 3:6 diamino acridine sulphate. For a discussion of the actions, uses and dosage, see above. Acriflavine is a brownish-red, odorless, crystalline powder, soluble in less than two parts of water and in alcohol, forming dark red solutions which fluoresce on dilution. It is nearly insoluble in ether, chloroform, liquid petrolatum, fixed oils and volatile oils.

Proflavine.—This is 3:6 diamino acridine sulphate. For a discussion of the actions, uses and dosage, see the preceding article, Acriflavine and Proflavine. Proflavine is a reddish-brown, crystalline powder. It is soluble in water and alcohol, forming brownish solutions which fluoresce on dilution. It is nearly insoluble in ether, chloroform, liquid petrolatum, fixed oils and volatile oils (Jour. A. M. A., Nov. 8, 1919, p. 1443.)

Pituitary Solution-Hollister-Wilson.—Liquor Hypophysis.—A sterilized solution of the water soluble extract of the posterior portion of pituitary glands of cattle, preserved by the addition of chlorbutanol. It is standardized according to the method of Roth and complies with the U. S. P. standard. The Hollister-Wilson Laboratories, Chicago.

Ampoules Pituitary Solution-Hollister-Wilson 1 Cc.—Each ampoule contains pituitary solution-Hollister-Wilson 1 Cc. (Jour. A. M. A., Nov. 29, 1919, p. 1699.)

PROPAGANDA FOR REFORM

Pinoleum.—A postcard advertising Pinoleum implies that Alexander Lambert, President of the American Medical Association endorses this nostrum. Dr. Lambert has never used the Pinoleum products, and protests against the dishonest method of advertising them. Pinoleum has long been advertised to the public via the medical profession. Its life history is that of the typical nostrum. Epidemics are utilized as opportunities for pushing the product. As the Pinoleum Company now misuses the name of Dr. Lambert, so it made the false use of the name of Dr. George W. McCoy, of the U. S. Public Health Service (Jour. A. M. A., Nov. 1, 1919, p. 1380.)

Lavoris.—In recent years, Lavoris has been widely advertised as "THE IDEAL ORAL ANTISPETIC", particularly to the dental profession. In 1913, a card was sent out according to which each pint of Lavoris contained zinc chloride, 1,040; resorcin, 0.520; menthol, 0.400; saccharin, 0.195; formalin, 0.195; cl. cassia zeyl., 0.780; cl. caryophyl., 0.195. Advertisements now appearing repeat the "formula", except that resorcin is omitted. The formula is indefinite and misleading in that no denomination of weight is given for the various constituents. Analysis in the A. M. A. Chemical Laboratory demonstrated that the Lavoris now sold contains no resorcin and that the zinc content is equivalent to 0.1 gm. per 100 Cc. (about ½ grain to the ounce.) As the analysis shows that the "formula" is not only meaningless because no demonination of weight is given, but that the zinc content is inaccurate for any denomination which might be assumed, the Council on Pharmacy and Chemistry declares the composition of Lavoris essentially secret. The Council also reports that Lavoris is advertised to the public indirectly with claims that are unwarranted and objectionable from the standpoint of public safety. Further, the Council reports that the name is objectionable in that it does not indicate the composition or potent ingredients of the mixtures and that the composition is irrational in that the user is likely to ascribe a false and exaggerated value to it. (Jour. A. M. A. Nov. 1, 1919, p. 1380.)

Olive Oil As A Laxative.—In order that digestible oils may act as laxatives, it is necessary to give more than can be digested and absorbed. In the case of an infant, this may be one or more teaspoonfuls daily, beginning with small dosages and increasing them until the desired effect is obtained. For adults, one or two tablespoonfuls may have to be given three times daily, either an hour before meals or two hours after meals. Olive oil may be taken mixed with hot milk or floating in fruit juice. Olive oil might be particularly serviceable in spastic constipation in an emaciated individual. The use of olive oil as a laxative would be contraindicated in obesity, diabetes, gastric atony and in hypochlorhydria, as well as in those inclined to biliousness (Jour. A. M. A., Nov. 8, 919, p. 1441).

Some More Misbranded Nostrums.—The following preparations have been found to be misbranded under the federal Food and Drugs Act: Fruitatives,

sold under the false claims that the laxative properties were due to the fruit extract; Tubbs' Bilious Man's Friend, a water-alcohol solution of sugar and plant extractives (rhubarb) with a very small amount of aromatics Deerfield Water, consisting in part of a filthy, decomposed and putrid animal and vegetable substance; Mederine, a water-alcohol solution of sugar, potassium iodide, methyl salicylate, salicylic acid, glycerin and laxative plant extractives, and Robinson Springwater, falsely claimed to be effective in Bright's disease diabetes, gout, rheumatism, indigestion, etc. (Jour. A. M. A. Nov. 8, 1919, p. 1458).

Acriflavine and Proflavine.—Tentative descriptions and standards for acriflavine and proflavine are published in New and Nonofficial Remedies for the information of manufacturers, pharmacists and physicians. In view of numerous inquiries regarding the therapeutic properties of these dyes which have been received by the Council on Pharmacy and Chemistry, the Council has prepared an abstract of the available literature on the subject. From this review, it is evident that the use of the dyes is in the experimental stage and that their value cannot be definitely judged. Of the thirty-four reports which are abstracted, twenty-five may be considered as favorable; seven are distinctly unfavorable and two are in the doubtful class (Jour. A. M. A., Nov. 15, 1919, p. 1542).

Medinal.—Medinal is a proprietary name applied to barbital sodium (sodium diethylbarbiturate), the sodium salt of barbital (diethylbarbituric acid, first introduced as veronal). The Council on Pharmacy and Chemistry reports that Medinal was omitted from New and Nonofficial Remedies in 1916 because the advertising issued by Schering and Glatz (who then acted as agents for the Berman manufacturer) contained misleading and unwarranted therapeutic claims. The Council further reports that Medinal, said to be manufactured in the United States, is now marketed by Schering and Glatz, Inc., but that the claims which are made for it are still unwarranted and prevent the acceptance of it for New and Nonofficial Remedies (Jour. A. M. A., Nov. 15, 1919, p. 1542).

Phylacogens.—A circular letter devoted to singing the praises of "Pneumonia Phylacogen" contains this: "Pneumonia Phylacogen has been found to be a dependable means of preventing and treating pneumonic complications of Influenza. In one large city it became a routine measure to give all persons affected with Influenza an injection of Pneumonia Phylacogen as a prophylactic of pneumonia. The results were remarkable. Not only did the cases improve rapidly but in a majority of them the pneumonia did not occur." The injection of Phylacogens is simply the administration of a mixture of the filtered products of several bacterial species. The results that follow represent the reaction of the bacterial proteins—a reaction for good or evil. There is no scientific evidence to show that they possess any specific prophylactic virtue. To recommend their use in patients with influenza, as a prophylactic against pneumonia, is unwarranted; and the physician who acts on the advice of the manufacturer must assume the responsibility of the results. In case of mishap, he cannot fall back on the manufacturer. He will find no scientific evidence to support him (Jour. A. M. A., Nov. 15, 1919, p. 1442).

Vaccines in Influenza.—The efficacy of vaccines in preventing influenza or of preventing or decreasing the severity of secondary infections is unproved. In view of the varying preponderance of the different organisms isolated from influenza cases, it is evident that even if a certain mixture is found efficacious in one locality, it may not be effective in another. Thus far, hope and imagination have exceeded scientifically controlled facts. Many vaccines come highly recommended by their manufacturers; but very little dependable evidence is submitted to show how much, if at all, the patient will profit therefrom (Jour. A. M. A., Nov. 15, 1919, p. 1544).

The Eli Products of Eli H. Dunn.—Physicians are receiving advertising matter from a concern that seems to operate under various names, such as "E. H. Dunn and Co.," "Eli H. Dunn," "Eli Laboratory," etc. The concern is located in Kansas City, Mo. It advertises "Eli 606 Capsules," "Eli Vaginal Capsules," "Eli 'Vim' Restorative," and an intravenous nostrum, "Ampules Eli Venhydrarsen." "Dunn's Intravenous and Restorative Treatment" is advised for the treatment of hysteria, and a price to the patient of three hundred dollars is suggested. The gross commercialism that permeates the advertising again illustrates the fact that the fad for intravenous medication offers an attractive field for those who would exploit our profession (Jour. A. M. A., Nov. 22, 1919, p. 1628).

Cortarnin Salts (Stypticin and Styptol).—The Council on Pharmacy and Chemistry announces the omission of cotarnin salts (Stypticin and Styptol) from New and Nonofficial Remedies. Salts of the base cotarnin have been used as local and systemic hemostatics. The hydrochloride was first introduced as "Stypticin" and is now in the pharmacopoeia as cotarnin hydrochloride. The phthallic acid salt of cotarnin—cotarnin phthallate—was introduced as "Styptol." In 1918, Stypticin was omitted from New and Nonofficial Remedies because the former American agents were no longer offering it for sale. Styptol was retained and is described in N. N. R., 1919. As was pointed out in the description (N. N. R. 1919), the evidence for the usefulness of the cotarnin salts has been contradictory and unstaisfactory. Now P. J. Hanzlik has made a thorough investigation of the efficiency of hemostatics and has shown the inefficiency of cotarnin salts. The evidence was so definite that the Council has directed the omission of the general article on cotarnin salts and the des-

cription of Styptol from New and Nonofficial Remedies (Jour. A. M. A., Nov. 22, 1919, p. 1628).

URI-NA Test.—The URI-NA Test, sold by the Standard Appliance Co., Philadelphia, bears a strong family resemblance to Capell's Uroluetic Test. Both are said to permit the detection of syphilis by an examination of urine. There is no method known at the present time by which the absence or presence of syphilis can be determined by a simple color test of the urine (Jour. A. M. A., Nov. 22, 1919, p. 1630).

Micajah's Wafers and Micajah's Suppositories.—The Council on Pharmacy and Chemistry reports that "Micajah's Medicated Wafers" formerly called "Micajah's Medicated Uterine Wafers") and "Micajah's Suppositories," sold by Micajah and Co., Warren, Pa., are inadmissible to New and Nonofficial Remedies because: (1) their composition is essentially secret; (2) the name of neither of these mixtures is indicative of its composition; (3) of unwarranted and exaggerated therapeutic claims, and (4) the therapeutic advice which accompanies the trade packages constitutes an indirect advertisement to the public. The "wafers" were analyzed in the A. M. A. Chemical Laboratory in 1910 and found to consist essentially of dried ("burnt") alum, boric acid and borax. The suppositories were recently examined in the A. M. A. Chemical Laboratory and, like the "wafers," were found to contain alum, boric acid and borax—and these substances practically alone—incorporated in cocoa butter. The company claims that "to these have been added Ammonii Ichthyosulphonate, Balsam of Peru, Ext. Belladonnae." The A. M. A. chemists report, however, that if extract of belladonna is present at all, it is in amounts too small to be detected by the methods commonly employed in the chemical examination of alkaloidal drugs.

The chemists report further that while ammonium ichthyosulphonate and balsam of Peru both have a decided odor and a dark color, the suppositories have but little color, and the odor of cocoa butter which forms their base is not covered by these drugs. Obviously, therefore, if ammonium ichthyosulphonate and balsam of Peru are present at all, the amounts are utterly insufficient to exert any therapeutic effect (Jour. A. M. A., Nov. 29, 1919, p. 1715).

PROGRESS IN MEDICINE AND SURGERY

THE NUTRITION OF THE FETUS. J. Morris Slemons. (Am. Jour. of Obs. Vol. LXXX, No. 2).

During the early months of pregnancy there is no maternal gain in weight, in fact often a loss, but the gain in the later months is marked and for the last three months it is as much as 3½ to 5½ pounds per month, the total gain being on the average about 30 pounds. This increase is due in part to the weight of the fetus, placenta, amniotic fluid and the breasts, but also to a general increase in all body tissues due to the stimulus of pregnancy.

From data, experiments and observations we are forced to the conclusion that the state of pregnancy, for the monther, is not one of sacrifice of body tissues. Experiments on dogs and rabbits, with elaborate analyses of food and excreta, show that a notable storage of food stuffs is characteristic of pregnancy. If this food storage is compared with the material in the tissues of the young, it appears that the mother's food is sufficient to meet her own demands and that of fetal development as well. Wilson, conducing similar experiments in human pregnancy comes to the conclusion that the *ordinary* diet provides for all the requirements of fetal growth and permits of maternal storage besides.

It is safe to presume that there is no great difference between the fetus and the adult so far as the food requirements are concerned, both using the same organic and inorganic substances which are always available in the blood of the mother.

The mother's blood contains nutrient nitrogenous substances, carbohydrates, fats, oxygen, water and inorganic salts which meet all the requirements of tissue growth and energy production; but, owing to the barrier place at the placenta, none of them pass directly from mother to fetus.

The question as to how substances pass through this placental barrier has given rise to two antagonistic hypothetical theories. The VITALISTIC theory which gives the chorionic villae an active part in the placental interchange. The MECHANISTIC theory gives this placental barrier the passive role of a semi-permeable membrane.

Gusserow has established the fact that so long as the placenta is normal no insoluble substance may pass it. Even the elements of the blood are confined to that circulation in which they originate and for this reason the child of a leukaemic mother presents a normal blood picture. This also holds true in the experiment of injecting insoluble medicines into the fetal or maternal circulations; they never pass from the circulation of the original host. Soluble substances, on the other hand, are found later in the circulation of the other.

Unfortunately, the only fetal waste product which has been extensively experimented on is CO2 and Doderlein in the "Handbuch der Geburtshulfe" for 1915 says, "At present it is impossible to state more than that fetal waste products make their way to the placenta and through it reach the maternal organism which subsequently eliminates them."

So far as the original work of the author of this article goes, he secured specimens of maternal and fetal blood simultaneously just after the infant was born. The fetal blood was obtained from the placental end of the cord, and the maternal from one of the veins of the forearm.

Protein, whose characteristic element is nitrogen, cannot be utilized as such but is broken into simpler

nitrogen compounds, the amino acids, which are absorbed into the blood stream and carried to all parts of the body where different organs rebuild them into different varieties of protein, the kind depending on the organ. These amino acids are used for both construction and repair purposes. All through life tissue protein is being destroyed, resulting in chemical compounds classed as waste products and, like the proteins, are characterized by the presence of nitrogen. The blood protein may be regarded as a reserve material and the broken or decomposed protein, on both the constructive and destructive sides of metabolism, as the non-protein nitrogen of the blood. (Symbolized n.p.n.)

Using the method of Folin, the author found, in a series of 35 cases of normal pregnancy and spontaneous delivery, an average of 25.2 mg. of n.p.n. per 100 CC of maternal blood and 24.9 mg. for the fetus. Not only is there a striking equality between the average for the mothers and that for the fetuses, but even a more striking equality between that of the individual mother and her fetus. In 20 of the cases the difference between the two organisms was not more than 1 mg. and in the balance a difference of only 2 mg. The most instructive observation was that furnished by a case of twins where the n.p.n. of the mother was 30 mg. per 100 CC of blood and that of each fetus was 30.2. The equality of the n.p.n. of the two organisms suggests free passage between them, perhaps a regulatory mechanism or apparatus, operative on both sides of the metabolic function, which can be best explained by that of simple diffusion. Before offering this as a final conclusion, however, all members of the n.p.n. family were studied, the amino acids, urea, ammonia, uric acid and creatinin.

Amino Acids: These are soluble crystalline substances and have been found by several experimenters to pass readily across a permeable partition and by a process of diffusion into body tissues. It is now known that amino acids are the material furnished by the mother out of which fetal protein is constructed. There is no foundation for the old belief that the placenta synthesizes protein for the fetus, the latter performs that function for itself. In determining the amount of this protein derivative in the blood, the method of Van Slyke was used because it takes more of the group into consideration than any other method. Since these acids are contained in both the blood corpuscles and the plasma, only the latter can be taken into consideration as only they are soluble.

Here a uniform excess was found in favor of the fetal plasma amounting to 2 mg. of nitrogen which means that some other factor was operative than that of simple diffusion of the placenta. Van Slyke found that when amino acids were injected into the circulation they were quickly absorbed by the tissues and an equality was not established until the tissues contained about ten times as much as the plasma. This is referred to as the "absorption" phenomenon. "The results indicate that the placenta absorbs these substances and prevents their departure from the fetal circulation."

The nitrogenous waste products of the fetus find their way through the circulation into that of the mother where they are eliminated through renal function which can only be brought about by placental diffusion. Experiments regarding urea concentration, which is the chief protein waste, show that in a series of 16 cases the amount for the maternal blood was 10.5 mg. per 100 CC and 10.4 for the fetus. In cases of nephritis where we have a high urea concentration, we find a corresponding increase in the fetal circulation. What has been said of urea is also true of ammonia for the test includes both waste products. Regarding *uric acid,* an average of 12 cases shows 3.8 mg. for both mother and fetus.

Regarding *creatinin,* Hunter and Compbell found in a series of 18 cases an average of 1.67 mg. per 100 CC of blood for the mother and 1.75 for the fetus while Plass, in a series of 12 cases, found an average of 1.7 for the mother and 1.73 for the fetus.

These rather startling results leave no doubt in the mind of the author that the placenta possesses a passive role in the transmission of nitrogen waste products; they pass as if the placenta did not exist and an estimate of the maternal blood holds good for that of the fetus.

Carbo-hydrates become available as glucose, the blood sugar. The method of Benedict was used. In a series of 24 cases the average for the mother was .13 per cent and for the fetus .115 per cent. Bargsma claims that the sugar content of the two organisms is always the same but his technique is criticized because he did not collect the specimens of blood simultaneously. The large majority of cases showed a slightly higher concentration in favor of the mother. In a case of double ovum twins, each having its placenta, the one had .099 per cent and the other .096 per cent of blood sugar while the mother had .12 per cent. Hofbauer's doctrine calling for the presence of placental enzymes as a necessity for fetal metabolism does not hold true.

Fats and Lipoids: A long series of observations was made and it was found that fats and lipoids were more abundant in maternal blood, and large maternal amounts were associated with large fetal amounts; but the most notable finding was the difference between the quantities in the two organisms and this was a constant finding. The difference is so great that one is forced to the conclusion that these substances do not pass through the placenta with the freedom that the other substances do. This may mean that an enzyme is necessary in their case or that they do not pass at all. Available observations show that the latter explanation is the correct one.

Mendel and Daniels used pregnant rats and injected Sudan III into the maternal blood and invariably it was found that the maternal fat was stained but never the fetal and the line of demarkation in the placenta was very sharp. This discovery and the difference in the maternal and fetal fat per centage demonstrates that fat is not one of the materials contributed by the mother to the fetus. The latter obtains its fats and lipoids from carbo-hydrates.

It is during the latter half of pregnancy that the placenta behaves as a semi-permeable membrane and we cannot, without certain reservations, give it this function during the early months of pregnancy when the chorionic villae are decidedly different.

No doubt water and the inorganic salts are regulated as the food products are. We cannot at present speak in regard to iron. The great amount of it found stored in the body of the fetus suggests a compensation for its scarcity in the maternal milk.

The fact that we have a high fat content in the maternal blood and a low content in the fetal blood and that the former does not pass over to the latter, might account for the storage of fat in the tissues of the mother.

Intrauterine death of the fetus in the presence of renal or cardiac complications on the part of the mother, may be explained as due to the inability of the latter to properly eliminate waste products.

There is no diet specifically adapted to the pregnant state; personal experience and the dictates of appetite may be as safely followed during pregnancy as before. Quantity rather than quality should be the guide and a diet that was sufficient before pregnancy will be found to be ample during pregnancy. Overeating rather than insufficient eating provokes discomfort. Any diet intended to control the growth of the fetus, carried out so rigidly as to weaken the mother, is detrimental.

ALBERT C. SCHULZE, M. D.

SOME STATISTICS ON MYOPIA IN SCHOOL CHILDREN: Ernest Thomson (Brit. Jour. of Ophth., Vol. 3, No. 7, July, '19.) during the period from August 1914 to July 1919, personally examined 3,349 school children from the county of Lanark, England, comprising a community engaged in agriculture, coal mining and industry. Such a population can rightfully be subdivided into urban, rural and mixed, respectively.

(1) Contrary to the usual orthodox teaching the author's statistics, incomplete as they are, refute the contention that myopia is more common in urban than rural sections. He found that of 2,655 urban cases 468 or 17.6 per cent were myopic. In the opinion of the reviewer the conclusion to be drawn therefrom may be altogether misleading if all factors are not carefully considered.

To elaborate further the author found in the urban group of 1,561 cases, 269 myopias or 17.23 per cent; in the agricultural group of 229 cases, 47 myopias or 29.52 per cent; and in the mixed group of 365 cases, 97 myopias or 26.57 per cent.

(2) The next point that the author considered is the mean myopia in the different districts. The procedure adopted was to add together the highest meridians of myopia in all the myopic children examined in each district and to divide the sum by the number of myopic children examined, thus obtaining the mean highest meridian.

The results thus obtained are as follows: in the urban district, number of children examined 1,561, mean of highest meridian in right eye 3.84, in left eye 3.34; in the agricultural district, number of children examined 229, mean of highest meridian in right eye 4.21, in left eye 3.15; in the mixed district, number of children examined 365, mean of highest meridian, in right eye 4.12, in left eye 4.10. It will be observed that the right eye has the higher mean meridian of myopia.

(3) It is generally asserted that divergent strabismus is the most common type of squint in myopia. This is quite contrary to the findings of the author for in his examination of 790 myopes, 65 showing strabismus and 9 probably squinting, 29 were divergent and 45 convergent.

PAUL D. BERRISFORD.

THE TREATMENT OF UTERINE CANCER BY RADIUM: Henry H. Janeway. (Surg. Gyn. and Obs. Vol. No.—) Statistics from the leading Surgical Clinics of the world indicate that the operative treatment for carcinoma of the cervix is far from satisfactory. Immediate mortality ranges from 10 to 20 per cent, and even in Wertheims first one hundred cases it was 30 per cent. The Surgical Procedure requires an expert and even in the hands of the expert postoperative sequelae occur, such as supparation in the abdominal wound, cystitis peritonitis, phlebitis, ureteral and vesical fistulae, etc. In addition to these disagreeable sequelae, there is always the possibility of a recurrence of the carcinoma. The author quotes Clark who says, "It is possible that when we make a final summary of our combined experience, we may have to accept the conclusion that a less radical operation, even though it save fewer cases, may be preferable when attended by a low surgical mortality and few or no operative sequelae."

Janeway recommends the use of radium in cases of uterine cancer because it avoids operative risk, disagreeable and dangerous postoperative sequelae and is in itself a very efficient method for the treatment of these cases. In his own work he reports seventeen cases of carcinoma of the cervix; twelve of which were clinically cured from three and one-third years to six months after treatment. Of the recurrent carcinomata of the cervix there were four cases, two of which were clinically cured. Sixteen and twenty-five months after treatments; four cases of carcinoma of the fundus, two of which were clinically cured fourteen and twenty-one months after treatment.

Regarding the question of dosage Janeway advises against the use of excessive doses of radium such as are used by Bumm who recommends a total dosage of eighty-seven hundred milligram hours to fifteen thousand milligram hours. A review of prominent radium users is given which shows that no two men are using the same dosage or the same method of treatment. Janeway's method consists of the use of three tubes inserted in the utero-cervical canal, arranged end to end in a long rubber tube. In the presence of a cervix ulcer additional tubes are dis-

tributed evenly over its surface and held in place by means of a mold made of dental modeling compound. This mold in addition to holding the radium in place as a protection for the bladder and rectum and if desired a piece of lead may be embedded behind it for filtration. The author recommends the use of from twenty to thirty or forty millicuries of emanation according to the size of the tumor treated. Bagg has shown that one millicurie will produce a general necrotic effect through a sphere of tissue surrounding the tube for a distance of one centimeter. The dose from twenty to forty millicuries of emanation is 2,640 to 5,280 millicurie-hours.

The article is concluded by the author as follows: "From the therapeutic standpoint, cancer of the uterus must be regarded as a local disease, and the most practical method of handling the disease at its site of origin must be adopted.

"Our present evidence indicates that radium destroys the disease at this site to a greater distance than the knife is capable of removing it, and does this with no risk of inconvenience to the patient and only a small tax on the skill of the surgeon. Every effort should, therefore, be made to secure its general use throughout the country."

G. A. Geist.

THE EFFICIENCY OF SURGICAL TREATMENT IN THE BLEEDING TYPE OF GASTRIC AND DUODENAL ULCER*—D. C. Balfour, calls attention to the fact that various complications may develop in direct connection with gastric and duodenal ulcer, such as acute and chronic perforation, obstruction, deformity, malignant degeneration, and hemorrhage, and present added problems to the surgeon; one of the most important of these is hemorrhage.

Gastric hemorrhage has been the occasion of more confusion in diagnosis, uncertainty in therapeutic indications, and irrationality in treatment both medical and surgical than perhaps any other gastric condition. This paper is concerned chiefly with two groups of cases, first, those in which operation has proved unsatisfactory because of error in attributing the bleeding to a lesion which is not present, and second, those in which the surgical procedure carried out has failed to obviate further hemorrhages even though a correct diagnosis has been made.

The first group of cases, namely, those in which no intrinsic lesion is present is very important, and requires careful study as to the cause of the hemorrhage; the hematemesis may be due to such extrinsic causes as the pancreas, appendix, gall-bladder, spleen, or liver.

In the second group of cases, the records of the Mayo Clinic show that 25 per cent of gastric ulcers and 20 per cent of duodenal ulcers have been complicated by one or more gross hemorrhages. In the earlier days of gastric surgery the operation of gastro-enterostomy proved to be so efficient in a large majority of benign lesions of the stomach and duodenum associated with hemorrhage, that the realization came rather slowly that at least some of the failures to obtain a complete cure including protection against further hemorrhage could be attributed to the fact that direct attack on the ulcer was not added to the indirect therapeutic measure of gastro-enterostomy. The recognition of the danger of malignant degeneration in gastric ulcer gave the first impetus to the practice of combining gastro-enterostomy with the radical excision or destruction of such ulcers. The advisability of such a principle is now well established. This has been shown in a series of 2875 ulcers of the duodenum operated on between January 1, 1906 and January 1, 1918; 20 per cent of the patients had gross hemorrhages before operation; 63 of these reported hemorrhages at some period following operation. Twenty patients who had not had hemorrhage before operation reported hemorrhages after operation.

The incidence of hemorrhage in duodenal ulcer following operation is definitely higher than the incidence in gastric ulcer, notwithstanding the fact that there is a greater tendency for gastric ulcer than for duodenal ulcer to be complicated by bleeding. A study of the types of operation done in these cases gives a clue to the reason why operation failed to protect a patient against further hemorrhages. In not one of the 83 cases in which hemorrhages occurred after operation for duodenal ulcer was the combined operation of excision of the ulcer with gastro-enterostomy carried out, and with the exception of 8 cases in which various types of pyloroplasties were done, a gastro-enterostomy alone was done in every case. This fact is significant, particularly when one compares the results of the established methods of excision and gastro-enterostomy in gastric ulcer in which, although the tendency to hemorrhage was a greater, a much smaller percentage of bleeding followed operation. The combined procedure of excision and gastro-enterostomy was carried out in only one of the 17 cases of gastric ulcers which bled after operation. These facts can only mean that the methods of direct attack combined with gastro-enterostomy which are used in the present treatment of gastric ulcer are a source of protection to the patient against further hemorrhage.

From a study of our own cases, it was perfectly evident that in both duodenal and gastric ulcers, gastro-enterostomy alone is insufficient to protect the patient against further hemorrhages, and that excision combined with gastro-enterostomy has given almost total protection.

Cautery is advocated as a very efficient means of carrying out excision in this group of cases, and inasmuch as some ulcers have bled after operation which had not bled before operation, it is reasonable to adopt the practice of destroying all ulcers that are reasonably accessible. This destruction can be accomplished in a very safe and efficient manner by means of the cautery.

UTERINE DYSPEPSIA—T. Gillman Moorhead, (The London Practitioner) recalls the long well known ideas that disturbances of the pelvic organs are fruitful sources of gastric trouble.

He mentions Moynihan's classical papers on appendicular dyspepsia, but states that nowhere has he been able to find any mention of uterine disease producing a clinical picture resembling gastric ulcer and so he quotes the histories of two cases of his own.

Case 1. Married woman, age 36, severe pain in stomach made worse by food and relieved by vomiting. Well up to a few months before. Menses regular and painless. Little constipation. Apart from stomach no complaints and nothing at first found in physical examination except a localized area of epigastric tenderness just above umbilicus. Vomit was thrice blood-stained. Treatment, even with rest in bed, no relief and vomiting and tenderness persisted. Morphia and bromides gave no relief. Another complete examination revealed nothing until a rectal examination showed a fibroid growing from the uterine wall and pressing on the bowel. At operation a tumor size of an orange removed. From the day of the operation no more vomiting, pain ceased, patient began to eat well, and became completely cured.

Case II. Unmarried woman, age 40, complains of gastric pain following food, and occasional vomiting. Seen off and on for nearly a year—no relief. Demanded operation because pain now severe and vomiting frequent. Menstrual history showed rather prolonged heavy periods but no tumor felt. Finally made belated rectal examination and felt a retro-uterine tumor compressing the bowel. At operation the fibroid was removed, and other organs carefully examined and nothing found amiss. Two years after operation patient reported that she had been perfectly well ever since.

In conclusion the author says that while these cases may not be exceptional, at any rate they reveal the importance of making rectal examinations in cases of supposed gastric ulcer that are not improving under treatment.

Probably it is only fibroids which remain impacted in the pelvis and which press upon the rectum that cause such symptoms, for we are all acquainted with the cases of huge fibroids existing along with good health and perfect condition.

Two things stand out in this article—First, the evils of not making a rectal examination sooner.

Second, the reflex quality of the symptoms which the author attributes to the uterus and which in reality are due merely to pressure on the bowel and sacral plexus.

CHAS. N. HENSEL.

PATHOLOGY AND CLINICAL FORMS OF CEREBRAL ABSCESS OF OTOGENOUS ORIGIN. Chas. G. Cumston, (New York Med. Jour. May 10, 1919) reviews the pathological and clinical forms of cerebral abscess as taught by the French school, namely bone, meninges and brain. The first were found in all cases where the petrous portion becomes involved. The meningeal lesions are pictured by a generalized suppurating leptomeningitis or a focus of pachymeningitis limited to the primary site of the osteitis, and may be encysted or diffuse, situated on either dura or arachnoid. But most important is the cerebral abscess most commonly found single as a circumscribed encysted pus focus. When multiple they may be regarded as of pyaemic origin and operative interference is useless. From various statistics given by different observers the brain is most frequently involved and the spheno-temporal lobe the most common site. As no importance has been attributed to this cerebral area, large abscesses may form in this region without giving functional disturbances. The abscess is usually encysted or walled off by a limiting membrane. A section through the site of the lesion shows, macroscopically, a normal whitish zone gradually becoming grayish with here and there small brown patches of dilated blood vessels as the limiting membrane is approached. The limiting membrane is dark red in color and 5 to 6 milimeters in thickness. Histologically there are three zones; a zone of necrosis, a zone of encystment or limiting membrane and finally a zone showing irritation of the perpheral structures, the nerve cells undergoing chromatolysis, the vessels being greatly dilated and gorged with leucocytes, lymphocytes and plasma cells. The pus of these abscesses is more ape to be thick, greenish in color and of an offensive odor. In order of frequency the bacteria found are streptococcus, staphylococcus and diplococcus. Acute abscesses are distinguished from chronic in that they are usually monomicrobic. In chronic forms mixed infection predominates. This confirms Lenterts theory that as the vitality of the bacteria decrease they are superseded by saprophytes. The diplococcus favors capsule formation while anaerobic types develop a diffuse abscess with necrotic walls. This type is an index of great gravity. French otologists maintain that there are two distinct symptomatologies in otogenous cerebral abscess; the first with rapid meningeal symptoms and the second typhoid like. With these are classed the latent form with no phenomena of an infectious process. Another clinical form assumes the picture of a brain tumor, slow pulse, headache, vertigo, vomiting and apyrexia.

Very minutely classified and each type separated, such are the teachings of the French school.

GEORGE C. DITTMAN.

A CONTRIBUTION TO THE HISTOPATHOLOGY OF EPIDEMIC ("LETHARGIC") ENCEPHALTIS. By Peter Bassoe and George B. Hassin. (Jour. of Arch. of Neur. and Psych., Vol. 2, No. 1)

The authors call attention to the various types of Encephalitis associated at times with stupor, somnolence and cranial nerve palsies such as the hemorrhagic superior polioencephalitis of Wernicke,

the cerebral form of poliomyelitis, the sleeping sickness caused by trypanosomiasis, syphilitic meningitis, paretic dementia, encephalitis caused by anthrax (Fulci) or other infectious diseases, as tuberculosis, cerebrospinal meningitis and especially influenza.

They give a brief clinical report of an infant of four weeks, whose illness began with vomiting and stupor, nystagmus and strabismus. Temperature varied between 98 and 103.2F. A detailed report of the necropsy findings in 3 such cases is given. Macroscopically, the brain appeared normal except that the pia was somewhat opaque and congested especially around the cerebellum. Microscopically, the pia was infiltrated with lymphocytes and plasma cells especially around the vessels. The vessels were congested and hyperemic and many red cells were also found in the surrounding tissues. This infiltration extended all over the pia but especially around the cerebellum and frequently involved the adjacent parenchyma. This mild leptomeningitis not so pronounced as in poliomyelitis or in paralyticdementia, very much resembles that described by Mott and others in Trypanosomiasis.

The central cortex shows few pathologic changes although various acute cell degenerations may be observed from the mild chromatolysis to the severe type where the cell body and nucleus is reduced to an amorphous granular mass. The pathologic findings in the basal ganglia the subthalmic area—the tegmentum are more pronounced. The vascular infiltration is marked and the cellular elements are very abundant. Many of the smaller vessels are congested, pack with blood pigment, and some contain thrombi. Very few capillary hemorrhages are found; degenerated ganglion cells are seen occasionally. No degenerative process was observed in the subcortical fibers. The pons, medulla and at times the spinal cord show the same intensity of interstitial changes as the large ganglia and the mid-brain. The spinal canal is often occluded, either by proliferated ependyma or by an amorphous mass mixed with leucocytes.

The authors believe that this type of encephalitis differs from the influential type, because in the latter the only lesions found are hemorrhages. The process more closely resembles the histopathological picture found in African sleeping sickness differing somewhat because of the chronic course of the latter.

E. M. Hammes.

THE TECHNIQUE OF GALL-BLADDER AND COMMON-DUCT SURGERY. Richter (Surg. Gyn. and Ob. Vol. 29, No. 5) states that the technique of gall-tract surgery is in process of becoming standardized. He emphasizes a few phases of the technique.

1. Enucleation of the gall-bladder.

He brings out that the cystic duct is not easily reached without the preliminary emptying of the gall-bladder. This is particularly true where the preliminary rotation of the liver is not readily accomplished. The tense gall-bladder pushes the cystic duct backward and upward, away from the operator and the apex is the only mobile part and must therefore be the most disturbed part. He splits the peritoneum as it is reflected from the liver to the gall-bladder, just enough to admit a finger. The finger is inserted and the gall-bladder peeled from its bed. The release of the tense gall-bladder will cause the fundus to push its way out of the incision, into ones hand and bring its apex measurably within control.

2. The cystic duct.

The author points out that the cystic duct should rarely be clamped with its vessels, tissues and peritoneum in two. It is quite unnecessary to ligate it close to the common duct. One must avoid the careless ligature of the apex of the gall-bladder itself, lest a continued infection of the stub of the gall-bladder remain. It is an odd fact that many writers insist upon severing the cystic duct close to its termination in the common duct. The very absence of any number of reports on recurrence of trouble in the stump of the cystic duct other than that due to stones left behind, should suggest that it is rarely the source of trouble.

3. The flap of peritoneum.

These flaps are merely pressed against the denuded surface of the liver. Suturing tends to lift the flaps out of the depressed bed leaving a space behind.

4. The raw surface.

The position of the raw surface is such that massive adhesions to it are naturally objectionable, but the surface itself is depressed and not exposed to contact with adjacent structures. E. Wyllys Andrews placed the omentum between the liver and duodenum. Oozing from liver surface is treated by haemostatic preparations, such as "coagulose."

The stump of the cystic duct is ligated with small cat gut and is left intra peritoneal, the abdomen is closed without drainage.

The author has carried out the idea of closure of the abdomen without drainage in all gall-bladder removals or common duct operations, except where unusual oozing from the liver surface made a gauze pack seem necessary, or where the apparent virulence of an acute infection made him fear a fulminant peritonitis. The number of cases has not been large, but there has been no death in the series. The post-operative recovery has usually been smooth, "like an uncomplicated appendix case," to use the expression of one of the house surgeons. A few cases have shown a reaction suggestive of what is commonly seen in patients in whom a gauze pack has been used. It has seemed to me that the leakage of infected bile from the denuded liver surface might possibly be a factor in the production of this reaction. It has not been necessary to reopen the abdomen in any case. No patient has developed an unusual temperature. The abdominal incision in all cases has remained clean.

E. M. Jones.

BOOK REVIEWS

CEREBROSPINAL FLUID IN HEALTH AND IN DISEASE. By Abraham Levinson, B. S., M. D. C. V. Mosby Co. St. Louis, 1919. $3.00.

The study of the cerebrospinal fluid and the diagnostic and therapeutic facts and speculations accruing there occupy a most important position in medical progress. Dr. Abraham Levinson has written a compact and comprehensive work incorporating into it the results of extensive studies from his own endeavors as well as facts gleaned from all reliable sources which came to his notice.

As no comprehensive work on all phases of the cerebrospinal fluid has yet appeared the author is to be commended for placing before the medical profession a timely work of this nature.

P. D. Berrisford.

THE FUTURE OF MEDICINE. By Sir James Mackenzie, F. R. S., M. D., F. R. C. P. L. L. D., F. R. C. P. L., Oxford Medical Publications, $5.00

If the author of this book means to ask the question, "What will the future of medicine be," he fails to answer the question directly If he means to prophesy what the future of medicine will be, the reader perhaps remains unconvinced: but if he plans to call our attention to the changes that must take place in the teaching and the practice of medicine, in its broadest sense, and as they are being conducted at the present time, in order to enable physicians to render the greatest amount of good to suffering humanity, then he succeeds in a striking and convincing manner.

The book is divided into three parts. In the first part, which is entirely critical in its nature, he critisizes outspokenly our present methods. We should pay more attention to the slight complaints and apparently insignificant symptoms as these manifest themselves only in the early stages of any disease, and when cure is most likely. While he recognizes the need of specialists and laboratory workers, he calls attention to the fact that they often do not see the patient or are not called in consultation until late in the course of the disease and then view the patient only from the narrow outlook of their own chosen field. He does not criticise autopsies but does criticise the limited way in which autopsy findings have used to interpret and explain the early signs of the disease and how utterly we have failed in the application of what they teach us to the field of preventive medicine.

In the second part of the book, the author lays bare his own personal experiences in the earlier years of his professtional work. Having accepted the teachings of his instructors in a more or less matter of fact, manner, he was greatly disappointed in afters years to find that much of what he had learned was without foundation and some of it entirely wrong. He was obliged to work things out for himself, and through his perserverance and ingenuity and his ability to analyze, he succeeded in finding out what caused different signs and symptoms and what they meant from the standpoint of diagnosis and prognosis. To attain the latter he was often obliged to make most careful observations over a long period of time, but only such observations after all as any one could make, unaided even by the present day highly specialized tests, etc.

The third and major portion of the book is constructive in nature. Here the author attempts to offer some suggestions, based on his own rich personal experience, as to how improvement can be made in the teaching and practice of medicine. We should pay more attention to the development of our senses of touch, hearing, sight, etc., and pay more attention to the analysis of what we find. In order that physicians can the better serve suffering humanity they must attach more importance to preventive medicine and to the early diagnosis of disease. We do not need more nor better specialists but we do need general practitioners who are more thoroughly grounded in the basic and fundamental teachings.

In one of the later chapters of the book, he writes, "If we look over the whole field of medicine and contemplate the different workers to recognize which worker has the opportunity for finding out the facts, essential to an intelligent prosecution of research, we can find only one type of worker who fufills the requirements, and this is the general practitioner."

The book is interesting as it deals with a unique subject; it is not without authority as its author is a man of international reputation; and it is convincing because he presents glaring instances and indisputable evidence.

A. G. Schulze.

THE DON QUIXOTE OF PSYCHIATRY. By Victor Robinson, Historico-Medical Press. N. Y. $2.00. 1919.

Victor Robinson writes in a very interesting manner the biography of Dr. Shobal Vail Clevenger whom he terms "The Don Quixote of Psychiatry." And true it is that Clevenger had a variegated and at times tumultuous career engaged as he was at various periods in the pursuit of pharmacy, inventing, civil engineering, psychitary, politics pedagogy, etc.

Most gruesome is that portion relating to the political abuses and crimes committed at the Dunning Institution for the insane under "King" Michael McDonald Chicago's political boss. It was during that period that Dr. Clevenger served as pathologist in the same hospital. Astounded at the debauchery and open manifestations of graft displayed by Warden Harry Varnell and his co-workers he soon realized that only a thorough upheavel of Chicago's political life could remedy the condition. Assuming the role of reformer, practically single-handed and at the peril of his life he undertook the Herculean task of cleaning the political stables. At this mussy and

thankless job he was fairly successful and for this he was rewarded. John P. Altgelt governor of the state of Illinois needed such a man as he to superintend the Kankakee asylum where things were not going well. Despite the advice of his friends and the force of his past experience he readily accepted, there to find a prevailing and irremediable condition that weighed upon his soul. When he offered a protest and at length became a disturbing factor in the political cosmos he was given a vacation.

Noted scientific friends he had in numbers with whom he kept in correspondence. The author has seized the opportunity to sketch a short biography of these men of science as they are introduced into the work, Joseph Leidy, C. B. Cope, Joseph La Conte, William Pepper, William Hammond, E. C. Spitzka etc., in fact not a small portion of the book is devoted to it.

The subject matter holds the reader to the end written as it is by an author with an excellent command of the English language, a subtile humor and a keen incite into human frailties.

The following are a few of the biting epigrams which the author so delights in:

"Nature is a harsh step-mother to the human race; if a man is syphilitic or has gallstones, his children are in danger of inheriting the disorder, but if he has a special talent, his offspring is not so liable to be infected with it."

"Nature often puts talents into the wrong hands."

"If patients were willing, he would kneel at their bedside and pray for them, and from Sunday-school pulpits he would relate how he and God cured the sick—tho it was common knowledge among his confreres that he would desert critical cases at critical times."

"Spiritus frumenti and spiritus vini galli have been denied a place in the latest edition of our Pharmacopeia: we wish there were also a way of expelling narrow-mindedness from science."

"An author who does not practice birth-control with his literary progeny, dooms most of them to early extinction."

"The arch-southern, proprietor of negroes and father of mulattoes,—a gentleman of such exquisite sensibilities that he was quite capable of selling his own children into slavery—needed a national disaster to convince him that he was out of place in the nineteenth century."

PAUL D. BERRISFORD.

VENEREAL DISEASES. By C. H. Browning M. D., D. P. H., and David Watson. M. B., C. M. Henry Frowde and Hodder & Stoughton, London. 1919. $6.50.

One often is inclined to approve or disapprove of a book, especially a text book, merely because one agrees or disagrees with the author. Thus I found myself unconsciously endorsing this book because the author gives it as his experience that vaccine treatment in Genito-Urinary practice is of very limited use. This happens to coincide with my experience. However agreeing with the author or not one must say that this text book is a very creditable work.

The usual comparison of chancre and chancroid has been omitted and the subject of chancroid treated only in a small chapter which is about all that this subject deserves these modern days. Instead the book goes into the diagnoses of the primary lesion of syphilis from the laboratory side very adequately. The detailed instruction of the various methods of identifying the spirochoeta pallidda by various methods including the dark field is very satisfactory. This is what the student requires.

The book is well worth careful reading.

E. C. GAGER.

HYGIENE AND SANITATION FOR NURSES. By George M. Price, M. D., Lea & Febiger. Philadelphia & New York. 1919. $1.75.

In the preface of the first edition of this book Dr. Price expressed the hope that "Hygiene and Sanitation for Nurses" might be of service to the nurse in her many and various duties which are no longer confined to the sick room, but extended to practically every phase of public health. The adoption of this book as a text book by many of the leading training schools for nurses and the demand for a third edition within the first four years of publication, proves that this hope has been fully realized.

The purpose of the book is to give the nurse a fundamental knowledge of the principles of hygiene in its various branches. This, the author is well fitted to do, not only thru his medical knowledge, but through his long association with the actual problems of municipal public health.

A consideration of the titles of its chapters: Introduction to the Study of Hygiene, the Hygiene of Habitations, the Hygiene of Foods and Food Supply, the Hygiene of Schools and of School Children, the Hygiene of Occupation, Personal Hygiene and an added chapter in the third edition on Infectious Diseases and their prevention, reveals the broad scope of this work. The subject matter is well presented and points of dispute and too detailed instructions on minor matters have been omitted. Undoubtedly this volume would prove a valuable hand-book to any one interested in public health work.

VERA WARREN.

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ORIGINAL ARTICLES

THE CLINICIAN AND RESEARCH*

BY W. W. HERRICK, M. D.,
New York City.

When a clinician whose largest task is the practice of medicine speaks of research he immediately feels somewhat on the defensive. Research has perhaps become a perquisite of the special laboratory worker,—a sort of esoteric performance to be conducted within the cloistered walls of an institution, into which the human problems of the ordinary work of the practitioner seldom enter. This is in a measure as it should be, since much of modern research in the sciences related to medicine has demanded just this isolation. It is true also that the ordinary practitioner, little to his credit, has small training and small interest in research; that he is absorbed in performance and not in theory, and that economic demands have too often stifled any nascent productive endeavor.

Pasteur described two kinds of men: the first, the scientist, who approaches nature with an open mind and a clear field and who, by experiment, observation and reasoning seeks to unmask her secrets: the second, the man of sentiment, whose instruments are instinct, emotion, faith and hope. Pasteur remarks that woe is to the man who thinks to mingle these diverse characteristics. Perhaps the difficulty the physician meets in research is that he must go counter to Pasteur's warning. He cannot approach the sick man in a purely scientific attitude; he cannot think of him as a mere test tube. He must take account of his own and the patient's hope and faith. At the same time he must keep the open mind, and while not blind to the qualities of Pasteur's second type of man, must solve clinical problems chiefly by experiment, observation and reason.

We are perhaps prone to forget the research work of the great clinicians of the past—of Pierre Louis, of John Hunter, of Beaumont, the elder Flint and others,—men who with little equipment except that of the general practitioner, blazed paths into unexplored regions that have been perpetual guidance to those who follow.

The state of clinical research seems to me comparable to that of the New England soil that gave sustenance to the hardy race of pioneers who left their mark on the entire world,—a soil that, with the settling of the richer regions westward was largely abandoned, but that now, under the pressure of population, is responding to intensive, scientific method and again bids fair to be productive. So clinicians as pioneers differentiated by painstaking observation the various forms of disease and laid the foundations of pathology. With the development of physiology, chemistry, bacteriology and immunology much of the research and most of the advance in knowledge was the result of work in pure science—a product of the laboratory—a virgin, fertile field, the end of whose resources is not yet. The clinician, rather pushed aside by all the latter development of laboratory method,—often, it must be confessed, somewhat bewildered by it—is now coming back to the fields he formerly tilled. Adopting the methods of his laboratory co-worker, he is applying them to his tasks and is correlating laboratory achievement with his own keen senses, his own practical judgment, and applying the resultant to the problems of the bedside, demanding as a right that all shall contribute to the needs of the patient. Armed with new weapons he may feel a new power over disease and in hearty co-operation with the chemist, the bacteriologist, and pathologist look forward with high hopes.

*Portion of an address delivered before the Minnesota State Medical Meeting in Minneapolis, Oct. 1919.

The greatest medical progress will result from this application of carefully chosen laboratory methods to the work of the practitioner, from a combination of the art, as expressed in a highly developed system of physical diagnosis, and the science in the form of precise laboratory technique. It would seem that the more immediate results in this endeavor are promised the general practitioner, in a study of the infections. For him this is almost a clear field. The family physician alone has opportunity to observe infectious processes from beginning to end. However, to achieve the greatest progress in their study he must divest himself of certain traditions.

Are not our conceptions of many diseases—perhaps of most diseases—based upon necropsy demonstration of end effects? We have visualized terminal anatomical variations from the normal and placed the label of a disease entity upon them. How often we forget all that has preceded and led up to this end result: the carrier period, the stage of incubation, the period during which the final anatomical changes are evolving. Have we paid due attention to the earlier phases? Are we not prone to conceive of disease as a fixed entity rather than the fluid thing it is, ever changing like the vital processes upon which it plays? Are we doctors not too much afraid to change our minds, to reverse our opinion, to tell the family it is something else? Do we not wait for late or terminal results in their anatomical-pathological expression before venturing a diagnosis and instituting treatment? Is it not time to shake off this stereotyped conception of acute disease as recognizable only in its late stages and, by turning attention to the earlier features of infections, to diagnosticate them earlier than we do?

One may ask, "Well, what difference does it make?" Little, perhaps in many infections, but how much in diphtheria, in meningitis, in Type 1 pneumonia, in tetanus? There is no need to quote well known statistics in support of this. Are we to believe that it will be long before research furnishes us effective weapons against other acute diseases?

It may be objected that acute infections are less important than formerly—that small pox, diphtheria and scarlet fever have lost much of their old time terror—that problems of perverted chemistry and physiology are more worthy of our attentive study. The reply of the civilian physician who was so fortunate as to serve in the Medical Reserve Corps during the past two years in an active mobilization center will not be in accord with this view. One who has cared for hundreds and even thousands of those stricken with acute disease will tell you of a very real appreciation of the importance of the commoner acute infections, and of a realization that, great as are the weapons against diphtheria, tetanus and meningococcic infection, we are as yet helpless before most types of pneumonia, of sepsis and the virulent exanthemata.

The problem to which the physician may apply himself with greatest profit is that of the early stages of the acute infection. It is the family doctor, not the hospital physician or the consultant before whom the inaugural symptoms of pneumonia, meningitis, tuberculosis and sepsis are exhibited and often in a remediable stage. Cannot our senses be trained so that, in co-operation with the laboratory, diagnosis can be made or at least approximated before the full textbook picture is drawn and valuable time lost? I believe they can and that here is the opportunity of the practitioner.

Let the family doctor be keenly alert for the initial symptoms of infections. Let him carefully record them and make use of the data collected. For the germ of an idea of systematic clinical research on a large scale, I am indebted to my friend, Dr. Grosh, of Toledo.

A central Committee on Clinical Research might be established, preferably under the auspices of the American Medical Association. Subjects for investigation could be assigned by this committee to Research Committees of state medical societies. The state societies might assign to county or local medical societies the subjects chosen for study with suitable instructions, blanks, outlines and reprints to serve as norms. For example, the subject, "Pneumonia" might be assigned a given state. For different phases of the problem, counties might be made responsible. Such points as the following could be studied: The percentage of cases showing antecedent coryzas, laryngitis, tonsillitis or other mild infective processes, the percentage

without such recognizable prodromata; the earliest features, as the period at which the respiration or pulse become accelerated, when cough begins, when rusty sputum, the average number of days of fever before the signs of consolidation appear, the variation in symptoms according to the type of pneumococcus concerned, the effect of therapeutic measures, and other similar problems. The data thus collected could be sent to a central point for collation and statistical evaluation, each contributor being given credit for his share. In carrying out this plan no great burden would be put upon any one practitioner, but interest in cases would be heightened, new avenues of intellectual endeavor would open, and once in a generation a master mind might be unearthed who, without the stimulus of a share in a common fund of research, would have continued to tread an uninspired, unproductive round.

The patent objection comes at once to the fore. The general practitioner is not so trained in observation that his findings have scientific value. He has not the technical facilities at his command to develop the important laboratory side of the early stages of the infections. It must be remembered that men better trained in physical dignosis and in laboratory methods are constantly implanted in smaller communities, and that laboratories are becoming more widely dispersed each year; also that the regional medical schools could with mutual profit co-operate in the movement suggested.

Would such a mass of observation collected from the common run practitioner have value? I believe it would. The practitioner, even of the old type, is no mean observer; given a little direction and guidance many will prove truly productive.

Experience in the Medical Corps of the Army revealed an astonishing lack of skill in physical diagnosis. This defect in training was often prominent in graduates from medical schools of the highest class in whom there frequently tended to be a slavish dependence upon the laboratory for evidence that the independent use of better trained senses would have made plain. Neither physical diagnostic nor laboratory methods can profitably be emphasized at the expense of the other. Both are essential, but if clinical research and clinical medicine are to advance, the well tried methods of the older clinicians must take their place, at least as equals, with the more technical and special, and often less relevant developments of the laboratory.

Diagnostic courage controlled by knowledge, judgment, skill and experience is perhaps rare. Most of us naturally like to have all the evidence in, to wait until the terminal pathology develops before committing ourselves. We dislike to change our diagnosis. We like to appear to be always right.

If we are to succeed in recognizing infections in their earlier phases, it is possible that this traditional attitude of diagnostic conservatism will have to be modified and that, until the profession at large and the public know our purpose, it will be necessary to abandon somewhat of our not too great appearance of infallibility. The object should be not alone to recognize the clinical picture upon which the label of a disease entity has been placed, but to recognize the carrier stages, the portal of entry, the inaugural symptoms and the species and type of invading organism before profound changes in bodily structure or function have taken place, and when the real therapeutic profit of early diagnosis may be gathered. This object can be attained only by the general practitioner and only by the collection of a mass of clinical data which shall revise or create a picture of the inaugural features of the infections that are on the whole too little regarded.

EPIDEMIC LETHARGIC ENCEPHALITIS

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In 1917, Von Economo of Vienna, reported 13 cases in which the patient manifested somnolence not unlike that observed in sleeping sickness. Frequently after a variable period—from two weeks to even months—death occurred. To this disease he gave the name Lethargic Encephalitis and he believed the symptoms to be due to a living virus similar to, but not identical with, poliomyelitis. There is, as Bassoe[1] has pointed out, a triad of symptoms, somnolence, irregular

*Read before the Ramsey County Medical Society, St. Paul, Nov. 24, 1919.

temperature and cranial nerve involvements, common to a dozen different brain affections, which may so closely simulate epidemic encephalitis as to make the differential diagnosis a matter of real difficulty.

There have occurred at least five epidemics of this disease which have been usually associated with pan-epidemics of influenza. The encephalitis may occur during or as most commonly happens sequential to influenzal attacks. Smithies[2] has reported one; Brasher, Caldwell and Combe[3] two, and Alexander[4] five, cases of encephalitis developing during the influenzal illness. It is the consensus of opinion that there is no other infectious agent so inimical to the nervous system as that of influenza. According to Starr, there is no part of the nervous system or its coverings that is exempt from its ravages. Abrahamson has properly emphasized the protean neurological symptoms which characterized the epidemic of last year. They were likewise present in the first great epidemic twenty years ago, although they were less marked in this country than abroad. Abrahamson prefers the name epidemic polioencephalitis because nuclear involvement dominates the pathological picture and also because lethargy is not an invariable symptom. The term lethargic encephalitis is ill advised, says Wilson, because it is not the encephalitis but the patient suffering from it that is *lethargic*. Sachs emphasizes the resemblance between epidemic encephalitis and the post-diphtheritic palsies both as a rule developing after the initial infection. No definite proof of the nature of the virus has yet been found. Weyeforth and Ayer[5] state that they neither saw organisms nor were they able to grow them from the spinal fluid or from the nervous system; postmortem inoculation was likewise a failure. Marineseo observed two types of organisms on his slides. Caldwell found in both of their cases a minute gram positive coccus identical to that found by Wilson in influenza, which they (Brasher, Caldwell and Combe) regarded as the probable cause of encephalitis lethargica. Wilson[6] believes that Von Weisner's diplo-streptococcus cannot be accepted as the specific cause of the disease especially if one considers the negative bacteriological findings in his two fatal cases. The researches of Loewe and Strauss[7] indicate the presence of an organism similar to that described by Flexner and Noguchi in polio-myelitis. It appears as small globular purple-bluish bodies—singly, in diplo forms, chains or clumps, which are found in the nasopharyngeal mucus membrane of patients afflicted with this disease. They have succeeded by inoculation of monkeys and rabbits with this filtrable virus in developing clinically and pathologically the picture of this affection. It is an infectious encephalitis, the habitat of the infecting agent being the nasopharynx from which it passes by the lymph channels to the vessels of the base of the brain, involving the brain stem, ganglia and cortex; also the upper cord, meninges and nerves. Abrahamson[8], chairman of the Committee on Epidemic Polioencephalitis in his report states that it has been established pathologically and experimentally that lethargic encephalitis is a distinct disease—a condition, sui generis, and one which until recently has escaped recognition and differentiation.

The following case will better enable us to understand the symptomatology of the disease. Mrs. A. age 44, was referred to me by Dr. H. C. Cooney of Princeton, Minnesota. As a girl her health was excellent; married at 21; two children both well; two miscarriages. Last January she suffered a nervous breakdown but made a good recovery. She had an attack of influenza last July from which she never fully recovered. She did not regain her strength and since has been somewhat depressed; felt as if life was not worth living and has been very nervous; appetite fair but sleep poor. For several weeks past she stated that it seemed as if bells were ringing in her head. She has also experienced a sensation of numbness in her hands. She did not complain of headache although she suffered from it to a slight degree before coming to the hospital. There was no vertigo but she had complained for several days of double vision. When admitted to the hospital, October 17th, 1919, there was marked asthenia, a temperature of 100.4°; pulse 100; respiration 26; tongue heavily coated; there was a typical Parkinson face; mentally she was bright and active. It was the time of her menstrual period and the discharge was most offensive. Her haemoglobin was 76 per cent; red blood cells, 4,364,800; white blood cells 9,260; blood pressure 145 systolic; 98 diastolic; urine normal. The neurological examination

was negative. Her condition remained practically unchanged for 36 hours; then a marked change was noticeable; her face was anxious; eyes sunken and she became very lethargic; would answer questions and indicate her wants. Because of the passage of clots and the character of the menstrual flow, I had Dr. George Earl see the patient. His findings were negative; the lethargy deepened; the patient lay with her eyes closed as in slumber. She would arouse herself sufficiently to ask for water, but would answer no questions. She was still able to take liquid nourishment if fed by a spoon. At this time there was a very marked rigidity of all the four extremities and also of the neck muscles; there were, however, no choreiform movements or tremor of the hands and legs. Both superficial and deep reflexes were absent but this evidently was due to the rigidity; no Babinski was present; sensation as usual in these cases was unaffected. Lumbar puncture showed a normal pressure and a clear fluid. The Wassermann and Goldsol reactions were negative; no increase of cells; no globulin excess. The pulse ranged from 160 to 180; respiration from 50 to 60 and very shallow; temperature from 102° to 106°; there was a profuse perspiration and at times there was a marked cyanosis. The stiffness of the neck muscles was evidently due to their rigidity. Meningeal symptoms develop less frequently in encephalitis than poliomyelitis. Delusions and hallucinations, as in any toxic psychosis, may occur. The patient was cataleptic and her condition for a time was very suggestive of catatonic stupor. For twelve hours preceding death which was evidently due to failure of the cardiorespiratory system, the patient was practically pulseless; autopsy was refused. The duration of the disease is indefinite, varying from a few days to weeks or months.

There is a belief, all too common in our profession, that encephalitis is a rare disease. The fact is that it is of frequent occurrence. Over 25 years ago I had under my care at the City Hospital a young woman in her early twenties who apparently was suffering from a grave chorea. There was no mental disturbance or cranial nerve involvement. The choreic twitchings were so violent as to throw her out of bed. Matresses were placed on the floor and against the wall to prevent her from injuring herself. Death occurred within a week. Autopsy revealed small punctate hemorrhages distributed through the cortex, basal ganglia and white matter of the brain.

Usually delusions, terrifying hallucinations and many times a wild delirium completes the distressing picture. Encephalitis occasionally complicates typhoid fever and only too well do we know that it is a common and fatal ending in cases of head injuries. How frequently do we see in our consultation rooms young children, mentally defective, who suffer from epileptiform convulsions and in whom one or more limbs are both paretic and spastic, the diagnosis at the time of the acute illness being teething or gastritis. This acute hemorrhagic encephalitis of childhood was recognized by Strumpell many years ago, who regarded it as an infectious disease. Buzzard[9] believes that the virus of Poliomyelitis is the infectious agent. Lethargic encephalitis is still another type of brain infection due to a specific virus.

Obsessed with the idea of a streptococcic infection, I for the moment overlooked the significance of the temperature, the Parkinson face, the diplopia and the previous influenzal attack, which the appearance of the lethargy made clearly apparent. This is present in 80 per cent of the cases. Lethargy and cranial nerve involvement are the most common symptoms, ophthalmoplegia being observed in 75 per cent of the English cases. The usual symptoms of a common cold together with lethargy and asthemia without the cranial nerves being affected may be the only symptoms. Epileptiform attacks have been observed but their occurrence is very rare. The temperature may vary little from the normal. There may be a moderate rise either at the beginning or during the progress of the illness; it also may be irregular or it may drop before exitus. Pain and stiffness in the neck may occur along with the Kernig sign. Rarely, if ever, are the clinical symptoms a replica of an acute Meningitis. (Wilson). Three months after its onset, certain manifestations of the disease have been observed.

Epidemic encephalitis occurs at all ages and affects both sexes about equally, infants, children and adults alike being attacked. The

seasonal incidence of this disease—Spring and Winter—is an aid to diagnosis. Its infectious character must be constantly kept in mind. Schnorr[10] reports a case of a physician who developed symptoms four days after his first visit to an encephalitic patient. The incubation in this instance was over three weeks; it may however, be only a few days; the onset is gradual; exceptionally sudden. Lethargy may be replaced by extreme restlessness. The patient's response to questions during the lethargic state is notably lucid and accurate. The stuporous condition is variable, duration ranging from a few days to several weeks. In a suspected case at Camp Custer, it lasted 47 days (Schnorr). Buzzard tells us that patients over 40 or even 50 years of age may develop encephalitis manifesting such symptoms as hemiplegia, hemianaesthesia, aphasia or hemianopsia, and not a little difficulty may arise in differentiating between it and cerebral tumor, brain abscess, cerebral hemorrhage and thrombosis. In his patients there were no cardiovasular changes to suggest the possibility of a cerebral hemorrhage. While the above symptoms indicate the involvement of the brain cortex, nystagmus, diplopia and ophthalmoplegia suggest the brain stem as being the point of attack.

There is another class of cases manifesting the same constitutional symptoms but giving us a very different clinical picture, viz: the mask-like face, the rigid limbs, the tremor, the posture, the gait of paralysis agitans, the basal ganglia in this instance being the chief point of attack. Abrahamson has reported two cases and Tilney one of the latter type. Epidemics of stupor in childhood[11] have occurred in England and France. Netter's belief that the Paris outbreak was due to epidemic encephalitis furnishes the most reasonable explanation of the English cases. The epidemic of toxic ophthalmoplegia described by Hall[12] and that of acute infections ophthalmoplegia reported by Harris[13] are without doubt manifestations of this infectious disease. Bilateral facial involvement as a post-influenzal condition Dr. Timme[14] believes to be rare. In Plattsburg he saw three cases who had had influenza overseas, after reaching camp, they became similarly affected, first one side of the face then, within a week, the other side being involved. I have seen one case of bilaterial facial involvement following an attack of influenza. It developed within twenty-four hours and there was marked disturbance of speech. The patient was exceedingly nervous, very irritable and his mental symptoms were those of hypomania. The facial palsy, speech disturbance and mental symptoms gradually disappeared.

A good illustration of deranged hypophyseal function is seen in the case of Miss B.—age 22, referred to me by Dr. Bigelow of Brandon, Manitoba. She had an attack of influenza, March 1919. Two months later she manifested the symptoms of a cold without fever. She was mentally confused, could not remember names. When asked to do one thing, she would do something entirely different. Twenty-four hours later, while assisting her mother in the kitchen, she suddenly tore off her apron, rushed into the dining-room, attempted to pull down the hanging lamp, and tried to pull down the curtain from the window. She was acutely disturbed all night, talked foolishly and incoherently. This excitement soon passed away, after which she shunned the family and stayed by herself as much as possible. During this period, she took on flesh rapidly. She became misshapen and coarse of feature; the flesh hung in rolls over the abdomen; there was also an enlargement of both hands and feet; the skin peeled off of these and her hair came out by the handsful. This condition lasted during July and August. A month ago, she began to talk to herself and had laughing spells; this was of short duration. At present she is irritable, nervous and emotional; she is very slow in dressing herself. Her sleep is good; appetite excellent; menses regular; flow profuse. Her weight at the beginning of her illness was 118 pounds; now 137 pounds; she was not weighed at the time she was most fleshy. Blood pressure 130 systolic; 85 diastolic; haemoglobin 85 per cent; red blood cells 4,410,000; white blood cells 10,000. Under the use of Pituitary Extract given by Dr. Bigelow, these symptoms gradually disappeared.

Tucker,[15] in speaking of these post-influenzal conditions says: "They are probably cases of Encephalitis of more or less severity—sine lethargica."

The deviation from the normal in the blood and spinal fluid is slight. The leucocyte count in my case varied from 9,200 to 11,260; it may reach 15,000 (Neal). As is usual in these cases, the blood culture was sterile. The spinal fluid may be normal or it may show a moderate increase in cells, small lymphocytes predominating, with an excess of globulin and albumin. The goldsol reaction resembles that of poliomyelitis; it has been aptly termed freakish. The reduction in Fehlings is normal. There is a notable contrast between the blood and spinal fluid findings in poliomyelitis and encephalitis. The Rockefeller Institute has reported a leucocytosis varying from 15,000 to 30,000 in the former. Neal states in the spinal fluid the cell count may vary from 150 to 200 in encephalitis. In poliomyelitis it may exceed 1,000 per c.m.m. Although the blood and spinal fluid afford no positive proof in support of a diagnosis of encephalitis, yet their examination materially aids in the exclusion of many obscure cerebral disorders[16]. According to Wilson, the macroscopic changes on the cranial surface are slight. There is meningeal congestion, with patches of localized meningitis and limited areas of subpial hemorrhagic effusion; also both gray and white matter are the seat of minute hemorrhages scattered irregularly, diffuse and of variable distribution. Other observers report hemorrhages few in number, very small and insignificant, while still others believe them to be agonal and of rare occurrence. The walls of the small vessels are infiltrated with lymphocytes and plasma cells. There are also foci of interstitial and parenchymatous infiltration with round cells. The lesions observed in the nerve cells are usually less extensive than in poliomyelitis and there is less neurophagia. There are also to be seen foci of perivascular hemorrhages[17]. The prognosis depends largely on the site of the lesion; the death rate in the French epidemic was 50 per cent, due to involvement of the bulbar centers. Weyeforth & Ayer report a mortality of 44 per cent. Hall reports 16 cases with no deaths; James states that the mortality varies between 15.8 to 20 per cent. Wilson lost two out of thirteen cases. McNally collected 168 cases with 37 deaths. While complete recovery is the rule, yet there are unfortunate instances in which the patient is left with an impaired mentality, with permanent cranial palsies, with paralyses of spinal origin and athetosis (British Report). In England, lethargic encephalitis is a notifiable disease. The same precautions should be observed as in an epidemic of poliomyelitis.

In October, 1918, a Committee of the Royal Medical Society of which Dr. Osler was a member, reported that in their study of lethargic encephalitis they did not get any picture resembling poliomyelitis and that it differed from all such analogous conditions. Putting aside clinical and pathological differences, says Buzzard, the epidemiological data are quite sufficient to prove that it is a distinct disease. The weight of evidence at present, Wilson believes, indicates that it is not identical with that affection. Neal is in accord with this view although the causative agent in the two diseases, she thinks may be closely allied.

The relation between lethargic encephalitis and influenza yet awaits positive proof. None of Schnorr's three patients had experienced a preceding attack of influenza. Abrahamson[18] can see no relation between the two diseases. On the other hand, in the cases of Bassoe and Neal and in the majority of those seen by Sachs there would appear to have been a more or less direct association with influenza. Attention has also been called to the fact that sufficient time has elapsed since the last epidemic twenty years ago for either disease to have appeared by itself if there were no direct relation between them.

Not knowing the nature of the infection, therapy must necessarily be unsatisfactory. Changes for the better, according to Netter, may set in abruptly, and he has observed recovery in grave cases associated with bed sores on the sacrum and elsewhere. Good nursing and free alimentation, using the nasal tube if occasion requires, are perhaps the most important measures. For the control of the choreiform movements and the tremor Bassoe advises scopolamine hydrobromide. Lumbar puncture should always be resorted to as an aid in diagnosis. If there is increased pressure of the spinal fluid, daily withdrawal is indicated. The therapeutic value of lumbar puncture is yet to be determined.

THE TREATMENT OF URETHRAL CARUNCLE*

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The varied and often unsatisfactory treatment of urethral caruncles and the high percentage of recurrence after their removal led us to study these growths and the best methods of removing them.

A review of the histories of patients with urethral caruncle who have been referred for examination to the cystoscopic department of the Mayo Clinic during the past four years (April 29, 1915 to June 1, 1919) showed that the symptoms most frequently complained of were urinary frequency, pain and burning on urination, soreness around the meatus, tenesmus, and bleeding. A few patients had no symptoms referable to the caruncle. Cystoscopy was done on all patients with a history of urinary trouble; the findings were usually negative. The nervousness which is a symptom in most of these cases is unquestionable due, in many instances, to the constant irritation in the urethra, since it disappears as soon as the caruncle is removed. In other cases, the nervous symptoms are independent of the caruncle since they persist after its removal. In many instances the inconvenience and suffering seem so out of proportion to the size of the caruncle, that it is often overlooked as the cause of the trouble.

The cases of urethral caruncle observed at the clinic make it possible to draw but one definite conclusion with regard to the etiology. Urethral caruncles seem to be secondary to a chronic irritation or ulceration of the urethral mucosa. Some observers have attributed caruncles to the gonorrheal type of chronic urethritis following directly on gonorrheal ulcerations. The bursting of retention cysts of Skene's glands has also been considered a cause (Englisch). It is probable that chronic irritation from many different causes plays a part in their formation.

Pathologically, urethral caruncles are of papillomatous outline with either a broad or narrow base growing from the posterior or lateral walls of the urethra just inside the meatus. I have found only one case of caruncle on the anterior wall reported in the literature (Neuberger). These growths vary in color from yellowish gray to bright red. Often acute inflammation of the anterior portion of the urethra and tissues surrounding the meatus renders the whole area exquisitely sensitive. Grossly, differential diagnosis of urethral caruncle and hemorrhoidal growths, urethral cysts, fibromas, prolapse of the urethral mucosa, and malignant growths is often difficult; the microscopic findings, however, are characteristic, showing them to be of a uniform structure, composed of loose connective tissue permeated by numerous blood vessels which are often much dilated. The growth throughout shows marked inflammation, and is infiltrated with mononuclear and polynuclear leukocytes. Many plasma cells are found, especially surrounding the blood vessels. Toward the free surface the blood vessels are newly formed. The growth is covered by the

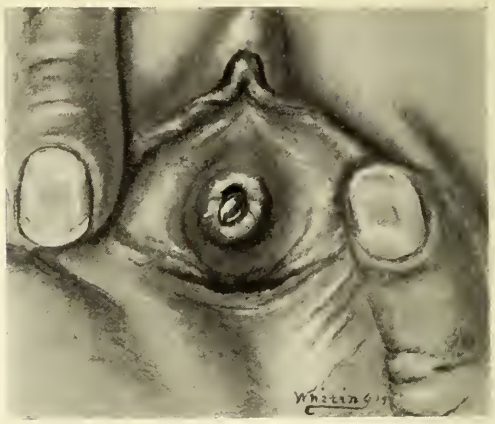

Fig. 1. Exposure of urethral meatus showing urethral caruncle with a single mass on the posterior wall.

Fig. 2. Exposure of urethral meatus showing urethral caruncle with posterior and lateral masses.

*Presented before the Southern Minnesota Surgical Association, June, 1919, Rochester.

usual urethral epithelial layer which in areas is thinned out or absent, leaving an easily bleeding ulcer. Virchow speaks of the normal folds of the urethral meatus as caruncles, designating what we know as caruncles by the term "vascular polyps."

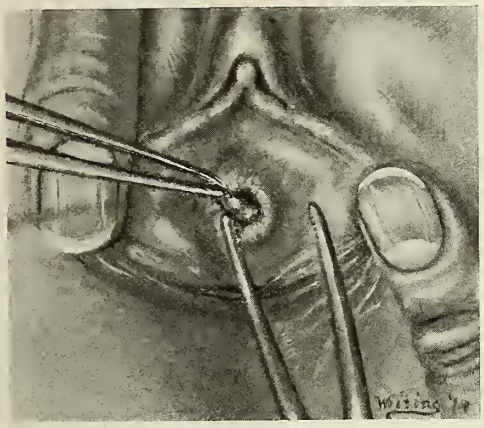

Fig. 3. Operative technic. Caruncle raised with pick-up forceps and ready to be seized by clamp.

Some authors have reported a malignant incidence as high as 25 per cent in the original caruncle and many malignant recurrences[10]. We have not seen a case of malignant recurrence, probably because of the fact that by our method the tissue removed is saved for microscopic examination, and early radical operation is done in all cases in which microscopic section has demonstrated malignancy in the original growth which grossly could not be distinguished from the usual benign caruncle.

In reviewing the literature on urethral caruncle, I find that the removal of these growths has been advised by such methods as excision,

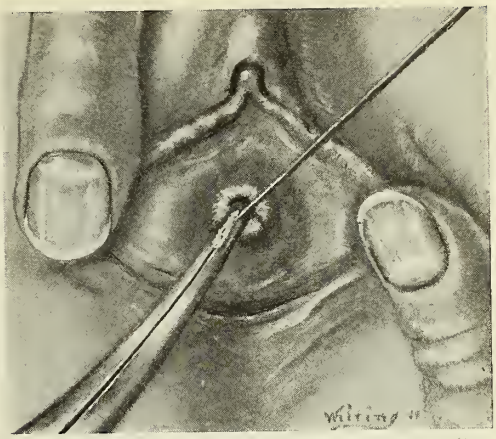

Fig. 5. Operative technic. Cauterization of stump before removing clamp.

actual cautery, various caustic acids, and high frequency current[1,3,4,6,7,9] Most articles record the fact that a recurrence is frequent and with it a recurrence of the original symptoms.

Recurrences have been divided, on the basis of our experience, into two classifications: First, true recurrence of the caruncle due to incomplete removal of the base, and second, prolapse of the mucous membrane of the urethra due to the contraction of the scar following the removal of the original caruncle. The majority of so-called recurrences belong to the prolapse group; they involve a portion or all of the circumference of the urethra proportionate to the extent of the original scar. A removal of this prolapse by any method merely results in a larger scar and in a repetition of the prolapse. We have seen several cases following removal of a caruncle and subsequently repeated removals of prolapsed mucosa in which the mucosa of the trigone was dragged down into the urethra

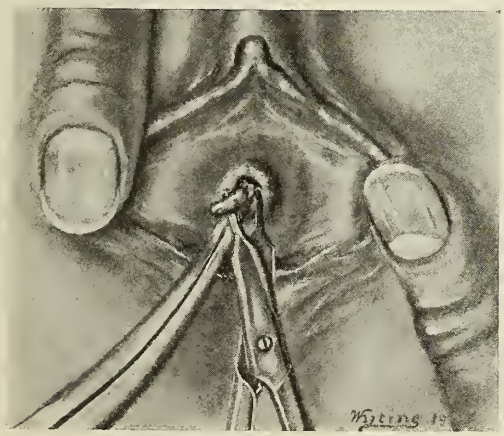

Fig. 4. Operative technic. Caruncle seized in clamp and about to be severed with scissors.

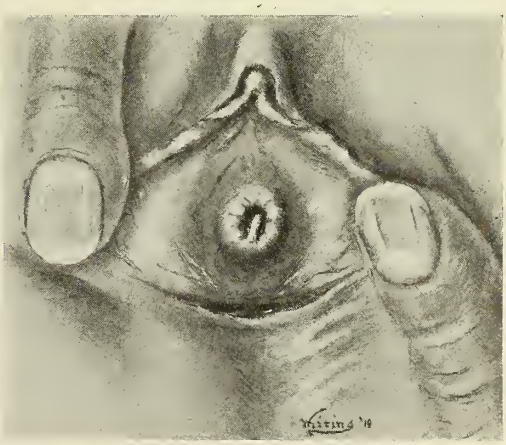

Fig. 6. Narrow cauterized stump after removing clamp.

Fig. 7. (Case 169585). Section of caruncle showing the general outline of the growth at low magnification.

Fig. 8. (Case 169585). Caruncle showing the characteristic structure and epithelial covering (X50).

and even protruded from the meatus. The many patients with recurrences of the second tpye, prolapse of the mucosa, who have consulted us and for whom permanent relief was impossible led us, four years ago, to adopt our present form of procedure which has proved very satisfactory. The steps in the method are as follows:

1. The patient is placed in the lithotomy position, and the parts are thoroughly cleansed with soap and water. A swab of cotton on a toothpick saturated in 10 per cent cocain solution and lubricated with a soluble lubricant is inserted into the urethra and left for ten minutes.

2. The labia are separated by an assistant. On examination the caruncle is found to consist either of a single tag on the posterior wall or of posterior and lateral masses. Each tag is picked up with a small Graefe fixation forceps and clamped off in the long axis of the urethra with a special clamp which has a broad blade and a narrow crushing edge. Care is taken to include in the bite all the caruncle and none of the submucosal structure of the urethra.

3. The growth is cut off close to the upper surface of the clamp; the crushing of the pedicle prevents all bleeding and makes an accurate removal possible. The specimen is saved for microscopic study.

4. The cut-surface is thoroughly seared with acid nitrate of mercury solution applied with a

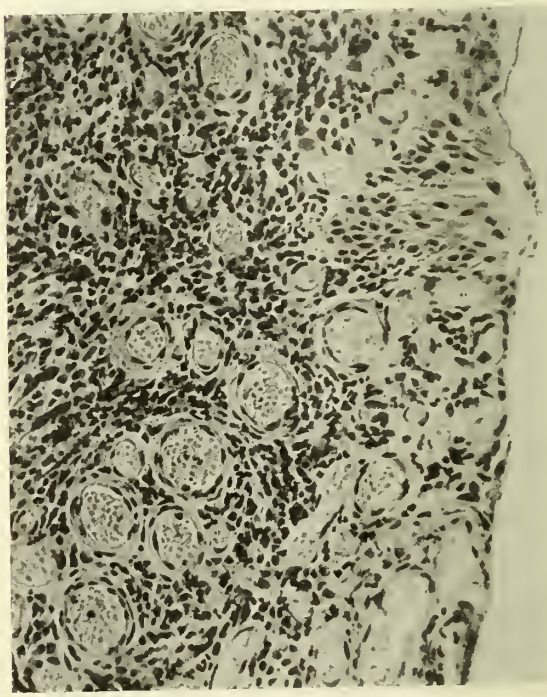

Fig. 9. (Case 169585). Section of caruncle shown in Figure 8 (X100).

wooden applicator. An excess of the acid to run over the blades of the clamp and cauterize other areas of the urethral mucosa is cautiously avoided.

All tags are removed in the same manner; when removal is complete one or more narrow longitudinal white lines about 1 cm. by 1 mm. mark the cauterized tissue; these lines are separated by normal mucosa. Within a week all evidence of the operation disappears. The advantages of this method or removal of urethral caruncles are:

1. The entire growth can be removed at a single operation.
2. The operation can be done without pain under local anesthesia.
3. Bleeding does not obscure the field during the operation nor annoy the patient afterward; the operator may be sure, therefore, that all the growth has been removed and recurrences thus avoided.
4. There is a minimum of scar tissue since there is no sloughing as the destruction of tissue is absolutely under control. The small amount of scar tissue remaining is in longitudinal lines and separated by islands of healthy mucosa so that a postoperative prolapse of the mucosa due to contraction of the scar does not occur.
5. Symptoms are relieved almost immediately.
6. The specimen removed is not destroyed and may be sectioned for microscopic study.

During the past four years 118 patients have been treated by this method; so far we have learned of only four recurrences.

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DISCUSSION

DR. C. E. RUTH, Des Moines, Iowa: In my earlier work I had a good deal of trouble with recurrences in these cases of urethral caruncle. It is quite readily explained as we get a better understanding of the pathology.

I was very glad to hear the essayist report successful results in those cases in which he used the cautery, although it is not the method I have used wholly. For the last six years or more I have used the galvano-cautery exclusively. As was stated by the essayist, the anterior wall is practically never involved, and for that reason, if we protect the anterior wall of the urethra by the blade of a urethral speculum we may with the small cautery point, such as is used quite extensively by rhinologists in cauterizing turbinates, destroy any of these growths in a moment under local anesthesia without pain to the patient, and in none of my cases have I had any recurrences since, and in no case has there been a complaint. The use of the cautery gives us an aseptic wound that heals kindly without pain to the patient, and no subsequent treatment is required in these cases.

DIAGNOSIS AND TREATMENT OF PERIPHERAL NERVE INJURIES

By A. F. Bratrud, M. D.
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The discussion of peripheral nerve injuries covers so vast a field and is such a difficult and perplexing problem, that to cover it in detail in the brief time allotted, would be impossible. One of the problems encountered at the outset was the difficulty of keeping these cases under observation for a sufficient period of time to determine ultimate functional result. It was at once realized that team work was essential in the care of this class of patients, and this was done with Major M. B. Tinker, Med. Corps, USA., Chief of the Department of Surgery at U. S. Army General Hospital No. 26 and E. M. Hummel Contr. Surg., as consulting organic neurologist, with the co-operation of the orthopedic department taking care of splinting and orthopedic complications and the physiotherapy department looking after massage, baths and electric treatment. I shall present some of the most important points in diagnosis which were gained from our observation of over four hun-

1 and 1a. Ulnar griffe and characteristic anaesthesia in severance of ulnar nerve. Some skin blocking above wrist.

dred cases and state briefly the operative technique and statistical review of the cases.

These cases were approached with the view of determining in as short a period as possible, the nerve or nerves involved, estimating the degree of injury, form of treatment to be pursued and prognosis for ultimate functional result. Cases were seen and examined carefully every three to four weeks, and records kept of any signs of increase or decrease in the severity of the symptoms. Subjective examination included—

1. Date of injury. Location, cause and position at time of injury.
2. Immediate symptoms.
   a. Motor loss.
   b. Sensory disturbances.
      (1.) Pain; location; onset; duration.
      (2.) Paresthesias; location; onset, duration.
      (3.) Hyperesthesia.
      (4.) Anaesthesia.
   c. Complications. (Fractures, etc.)
3. Subsequent symptoms.
   a. Motor.
   b. Sensory.
   c. Vasomotor (Cyanosis, edema, sweating.)

2. Ulnar and medium anaesthesia with skin blocking. Marked contracture from peritendious adhesions and contraction of interossei muscles.

   d. Trophic. (Nails, hair, skin.)
4. Treatment and date of healing of wound.

The objective examination gave information commensurate with the time spent. This included:

1. Wound. Location, character, size (open or closed). Usually, severe lesions of nerve could be excluded, where direct trauma could not have been produced by the missile but from resultant edema and pressure.
2. Attitude of extremity; i.e., wrist drop, etc. This at once gave a clue to the nerve involved.

3 and 3a. Anaesthesia in severe ulnar musculospiral and median nerve lesion. Glove anaesthesia which is seen in many functional cases.

3. Specific atrophy. Though this is always present, due consideration must be made in case of prolonged disuse of a limb,

lack of active exercise and physio-therapy. It is always more marked early in irritative nerve lesions.

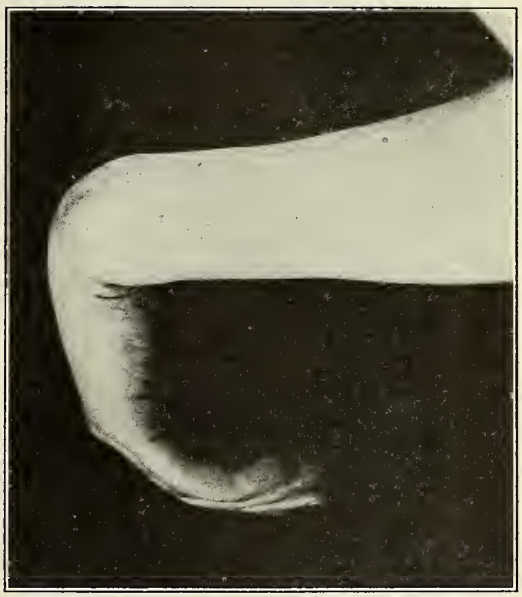
4. Trophic changes.
   a. Skin. Smooth, glossy, scaly.
   b. Hypertrichosis.
   c. Nails. Dry, curved, ribbed and brittle.

These trophic changes are relatively insignificant in cases in which the limb has had active exercise, massage, baths or electricity; so as to keep up lymphatic and blood circulation. Hypertrichosis is

4. Complete musculospiral showing rather typical distribution. Note absence of contraction of supinator longus muscle.

present in any limb after extra protection as by a cast, and is of no diagnostic value.

5. Vasomotor disturbances. Sweating, cyanosis and edema. These may occur in an entire extremity or the peripheral distribution of the nerve involved or of the nerves not involved, i.e., in the peripheral distribution of median when injury is to the ulnar nerve.
6. Muscle tone. There is usually a fibrous feeling to the muscles in irritative lesions. At times, they are very tender to touch. Very rarely do we have any pain upon pressure when a complete severance exists. In complete severance, the muscles appear to hang from the bones, and the fingers may be pressed in between the muscles and the bones.
7. Motor Disturbances.
   a. Active Motion. This should be estimated both in the range of the motion and motor power present. Careful observation is necessary to determine the source of error and misinterpretation of muscle action present, due to the enervation of extraneous muscles: i.e., abduction of the fingers by the common extensors in ulnar paralysis, or extension of wrist by contraction of the interossei and common flexors in musculospiral lesions.
   b. Passive Motion. Location and degree of limitation of movement or



5. Wrist drop is musculospiral lesion.

excessive mobility. Limitation of movement is usually present in irritative nerve lesions due to fascial contractures and peritendinous adhesions. Other causes should be noted, such as defects in tissue involving muscles or tendons, joint fibrosis ankylosis, and contractures resulting from improper splinting or prolonged immobilization. Excessive mobility is always present in complete severance. In the case of a sciatic, the foot appears to dangle freely when the leg is moved about. In severance of a musculospiral, the carpal bones may even be dislocated from prolonged wrist drop. A rule which can nearly always be adhered to is, that the nerve supplying the

sensation to the skin surrounding a joint, supplies the ligaments of the joint.

8. Reflexes. Absence denotes severance or equivalent of the reflex arc. We have been unable to attach much importance to idio-muscular reflexes.
9. Sensory Disturbances. Sensory loss, anaesthesia, hypoasthesia or hyperaesthesia to light touch and pain is best tested by using a soft camel hair brush. The patient is instructed to keep his eyes closed and answer "yes" every time he feels a stroke of the brush, as the operator works from the anaesthetic toward the normal area. Sensory loss is fairly normal in various lesions, though overlapping and abnormal distribution occurs, as will be seen from the pictures and sketches. Sensory loss from skin blocking must always be borne in mind. The area of pain disturbance usually follows those of a touch area in peripheral nerve injuries. It is best determined with a pin.
10. Tinel's sign, D. T. P., or distal tingling on percussion. This depends on the fact that when regenerating axones are percussed, there is a tingling in the distribution reached at that time. When regeneration is complete, it is lost. The limb must be at rest at the time of the examination so as to avoid tingling from jarring of the limb. Percussion should be light and performed from a point distal to lesion but not close enough to cause jarring of the scar or wound site.

6. Partial right musculocutaneous nerve lesion showing biceps muscle entirely gone.

7. Circumflex nerve lesion. Inability to elevate arm.

When correctly performed it is a reliable guide in determining the course to be pursued, when surgical interference is questionable.

11. Electric Examination. This gives valuable information and dispels doubt in complicated and difficult cases, helps in making a prognosis and gives valuable indications as to treatment. It is dependent upon the reaction of degeneration in the neuro-muscular mechanism, and usually begins in about two weeks. It may be partial or complete. The characteristics of partial R. D. are:
    a. Decreased faradic and galvanic contractility by direct stimulation to nerve.
    b. Decreased faradic irritability and decreased galvanic irritablity by direct stimulation to muscles. Galvanic contractility may be increased early in the course.

    The character of the response is of more significance than the volume, it being a slow, sluggish, worm-like character where the R. D. is partial or complete, or even lost entirely in complete R. D. Faradic contractility excludes real paralysis. Greater contraction on reversal of the poles is often present. The current should not be used strong enough to cause an overflow contraction from stim-

8. Median Nerve lesion, also internal cutaneous. Distribution of internal cutaneous is wider than normal on account of skin blocking.

ulation of antagonistic nerves or muscles. The muscles of the normal limb should be tested before applying stimulation to the affected side. In any lesion where the R. D. is present, motor points of muscles always tend to move toward the distal portion of limb. Scars, fascial contractures and peritendinous adhesions must be given due consideration. Prolonged splinting and immobilization may so vitiate the result as to make the electric examination of no value. Lastly, it must be remembered that motor function will return before the excitability to either faradism or galvanism.

Motor results of a nerve lesion are by no means easy to demonstrate. With each nerve lesion there are critical movements which are lost and an accurate knowledge of the peripheral distribution to the various muscles is essential as well as careful observation to exclude the action of extraneously enervated muscles. Characteristic critical loss of motor function in muscles or groups of muscles supplied by the different nerves is given briefly with the characteristic deformity of each. With injury to the musculospiral nerve, there is inability to extend the forearm, wrist, proximal phalanges of fingers and thumb. Occasionally, extension of the thumb is produced by the abductor pollicis through its median nerve supply, which in some cases sends a slip to the dorsal expansion of the distal phalanx. The powerful supinator longus does not show any contraction on flexion of the elbow. Wrist drop is the characteristic deformity.

With median nerve paralysis, the only critical motion lost is the inability to flex the distal phalanges of the index finger and thumb. Occasionally, a median griffe is seen, consisting of a moderate flexion of the distal phalanges of the thumb, index and middle finger. It is the result of contraction and adhesion of the flexor tendons and sheaths.

Motor loss in ulnar lesions is essentially a loss of the action of the little and ring finger and of the intrinsic muscles of the hand. The action of the dorsal interossei is to abduct the fingers and extend the distal phalanges, whilst the palmar interossei flex the proximal phalanx on the metacarpals and adduct the fingers. The lumbricales may compensate so as to feebly flex the proximal phalanx of the index and middle finger and extend the distal phalanges. At times, other muscles have so compensated as to show only loss of abduction of the little finger. Paralysis of the abductor pollicis is best tested for by having the patient hold between the index finger and thumb of each hand a piece of paper, and when pull is exerted on the paper, it is seen that on the normal side there is close opposition of the thumb and index finger, while on the side of the lesion, the paper will be held between the tip of the flexed thumb (median supply) and the index finger (prehension sign). Where the lesion is below the supply to the flexor, an ulnar griffe is produced by the action of the common extensors and flexors against unopposed action of the paralysed interossei and lumbricales. There is hyperextension of the proximal phalanx with flexion of the distal phalanges and abduction of the little finger.

Lesion of the circumflex causes a loss of abduction and elevation of the shoulder (deltoid). Even though we have great complexity of paralysis in lesions of the brachial plexus, great difficulty will not be encountered, if it is remembered that lesions of the fifth and sixth cervical roots cause involvment of the deltoid, biceps, brachialis anticus and supinator longus. If the lesion is sufficiently high, i.e., in the roots, there will be involvement of the rhomboids, supra and infra spinatus and subscapularis with resultant winged scapula deformity. With involvement of the eighth cervical and first dorsal, we have involvement of the intrinsic muscles of the hand. From the eighth cervical a median griffe may result, and from

the first dorsal root, an ulnar griffe usually results.

In the lower extremity, muscular action is simpler. Peroneal lesions cause inability to dorsi-flex and pronate the foot, while internal popliteal involvment causes inability to plantar flex and supinate the foot. Very rarely do we find a lesion of the sciatic high enough to cause interference with the hamstring group of muscles.

Lesions of the anterior crural causes loss of extension of the leg on the thigh, and weakness in flexing the thigh on the abdomen.

9a and 9b. Fairly typical distribution of fifth and sixth cervical root lesion. Shows wasting of rhomboids supra and infra spinatus.

Various clinicians have divided lesions of nerves according to the severity of injury into four syndromes and this answers well for all purposes. They are as follows; syndromes of interruption, compression, dissociation and irritation.

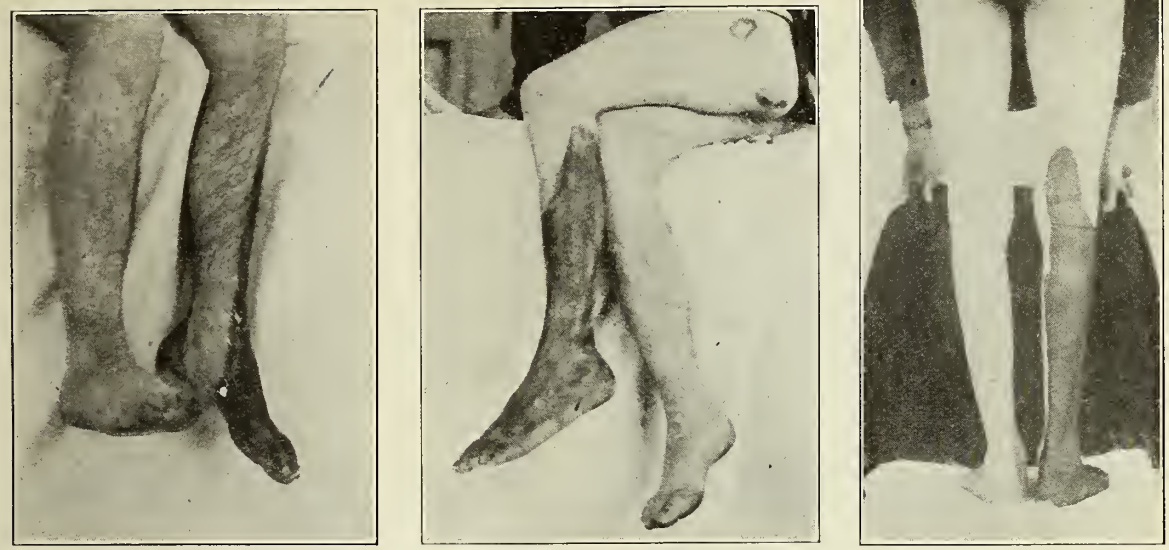
Characteristics of the syndrome of interruption are:

10. Musculospiral paralysis. Shows action of interossei (ulnar distribution) flexion of the proximal phalanges on the metacarpals, and extension of the distal phalanges in the proximal phalanges.

1. Paralysis of the muscles in the peripheral distribution of the involved nerve below the site of the lesion.
2. Specific atrophy, less marked early in the course than in irritative lesions.
3. Loss of tone of the involved muscles and ligaments causing characteristic deformities mentioned above, i.e., ulnar griffe, foot drop, etc. Excessive mobility of the joints due to lax ligaments many at times be so great as to permit dislocation of bones or joints, i.e., carpals in musculospiral lesions.
4. Loss of reflexes.
5. Reaction of degeneration.
6. Localized sensory loss in the peripheral distribution of nerve below the site of the lesion.
7. Absence of parethesias.
8. Vasomotor and trophic disturbances.
9. Negative D. T. P.

Briefly, the syndrome of irritation comprises lesions which cause continuous or intermittent pains below the site of the lesion, made worse by pressure, i.e., causalgia.

Syndrome of compression is in reality a prineural condition which produces practically the same symptoms as that of a physiological interruption only to a lesser degree. The muscles are sensitive to pressure below the lesion Vasomotor and trophic disturbances are usual-



11a, 11b and 11c. Anaesthesia in great sciatic nerve distribution.

ly worse than in interruption. Dissociated lesions involve only specific muscle and muscle groups.

Treatment of these cases should be carried out with the view of preventing deformities and preserving nutrition of the limb in order to have it in the best possible condition for regeneration and operative interference, should the latter be indicated. Proper application of splints is essential to paralysed musles, but we have seen so serious contractures result from prolonged immobilization, that good functional results were an utter impossibility. They should be encouraged in all non-harmful motion, active and passive, i.e., any motion which does not overstretch already paralysed tendons. Baths of various types as well as massage and electricity should be given as soon as the condition of the wound will permit and if these are carried out, trophic and vasomotor changes will be insignificant.

Operative technique varies in different hospitals in regard to the length of time to wait after the healing of wounds on account of residual infection, preparation of patient, anaesthesia, protection of involved nerve, etc. The technique at U. S. A. General Hospital No. 26, is as follows:

1. Three months interval after complete healing of wounds.
2. Forty-eight hour preparation of patient.

12. Prehension seen in ulnar nerve injury.

3. Local and gas-oxygen anaesthesia from standpoint of
   a. Aid to careful dissection.
   b. Aid in locating site of lesion.
   c. Patient's postoperative safety and comfort.
4. Excision of scar.
5. Neurolysis of nerve or resection of neuroma or severed ends of nerve to normal looking nerve fasciculi as indicated.
6. End to end suture with fine silk, being careful to have no eversion of sutured ends.

7. Fat fascia graft around nerve or transplanting to muscle bed for protection of nerve or suture line.
8. Autogenous or homogeneous grafts to fill gap where distance is so great as not to allow apposition of ends by transplanting nerve or by position of limb.
9. Pedicle flap from chest where extensive loss of tissue.
10. Carrel-Dakin if suspicious infection. (16% of scars show positive culture.)
11. Loose suture of wounds.
12. Tendon transplantation if muscle or tendon destruction is so great as to offer poor prognosis.

In the following tables are grouped (1) cases which we have treated and followed to complete recovery; (2) cases which show satisfactory progress and should obtain good functional result; (3) cases in which signs of spontaneous recovery are not present and will require surgical measures; (4) failures from neurolysis after lapse of six months; and (5) cases operated and in which sufficient time has not elapsed to determine functional result. All cases will be followed, and at the end of twelve months, report of these will be published.

TABLE OF CASES

	Class 1. Recovered	Class 2. Recovering	Class 3. Surgical	Class 4. Failures	Class 5. Insufficient times to determine	TOTAL
Suture						
Ulnar	1	2			12	15
Median		1			4	5
Musculospiral		5			3	8
Brachial Plexus						0
Sciatic		2			6	8
Peroneal					4	4
	1	10	0	0	29	40
Neurolysis						
Ulnar	2	3		2		7
Median	1	3		1	3	8
Musculospiral	1					1
Brachial Plexus		1				1
	4	7	0	3	3	17
No operation						
Ulnar	22	47	3			72
Musculospiral	23	40	6			69
Median	11	19	2			32
Musculocutaneous	4	3	0			7
Brachial Plexus	2	4	1			7
Circumflex	4	2	2			8
Sciatic	7	17	3			27
Peroneal	19	12	3			34
Anterior Crural	1	0	0			1
Post Inter osseous	2	0	0			2
	93	144	17			257

Cases operated previous to admittance.

	Recovered	Recovering	Failure	Too soon to determine	TOTAL
Sutures					
Musculospiral	4	1	2	1	8
Ulnar	3		1	1	5
Median	1				1
Sciatic		3			3
Peroneal					
Neurolysis					
Ulnar	1			2	3

Failure in this series was due in two cases to dense neuroma which was not resected and in remaining cases to infection.

CONCLUSIONS.

1. Careful examination and records every three or four weeks of changes in motor results, sensory disturbances and electrical reactions, is essential to correctly estimate degree of severity on injury and determine course of treatment.
2. Proper splinting, where indicated, is essential in prevention of deformities and in correction of already present deformities. Improper splinting may so alter tissues and cause such deformity that at best, period or recovery will be prolonged by months or make ultimate complete functional result an utter impossibility.
3. An accurate knowledge of the anatomy of the parts involved is essential for a careful dissection and preservation of all muscular branches.
4. Operative technique is so varied, and calls for such unusual judgment that a successful outcome may forever be spoiled by a poor operator.
5. A physio-therapy department with well trained men or women must work in conjunction with the neuro-surgical team, changing treatment whenever necessary to meet special requirements. The patient should be encouraged in both active and passive non-harmful exercise.
6. About seventy five percent of cases go on to spontaneous recovery.
7. The patient should be made to feel that a personal interest is being taken in him by a well organized team, and that even if ultimate complete functional result is not obtained by physic therapy, splinting, nerve liberation or suture, that a successful end result may be had by tendon transplantation.

THE CLINICAL COURSE AND PATHOLOGY OF AN OBSCURE OSTITIS CAUSING LOOSE BODIES IN JOINTS*

By A. R. Colvin, M. D., F. A. C. S.
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Four cases of knee joint trouble presenting unusual features form the basis of this article. Pain extending over a period of four years in one case was the only symptom felt or complained of and in the other three, pain alone was a predominating symptom.

CASE 1: Male age 51. No history of injury of any kind, first noticed symptoms after a long drive on a winter's night, in getting out of the sleigh he could not straighten his knee and for a year following could not entirely straighten it, forcible efforts to completely ex-

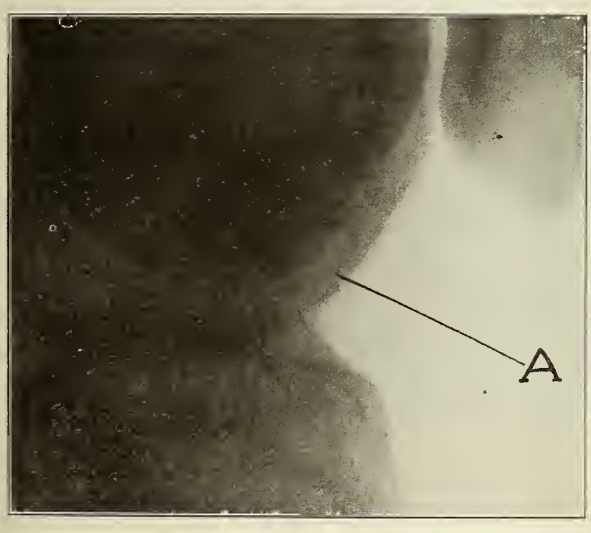

FIG. 1: Shows at (A) the area of bone which later became detached and was extruded into the joint.

tend it caused pain, at other times only a dull ache was experienced. On examination there was neither swelling nor joint tenderness. A radiograph (Fig. 1) showed on the joint end of the mesial condyle a small body in a small well defined oval area; a diagnosis of osteochondritis was made and the opinion expressed that the body referred to would sooner or later become free in the joint cavity. A year later the first symptoms of a loose body were noticed and a radiograph (Fig. 2) showed a body in the

*Read before the Southern Minnesota Medical Association at Rochester, June 23-24, 1919.

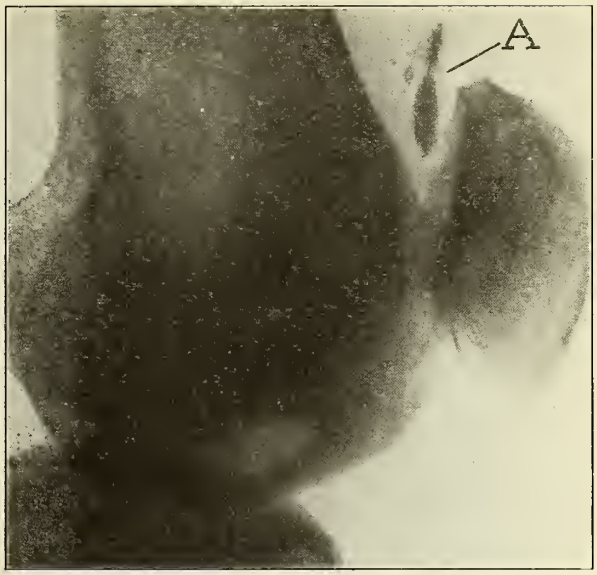

FIG. 2: Showing at (A) the body referred to in FIG. 1, which has become detached and extruded into the joint. The oval area which it formerly occupied is now seen empty.

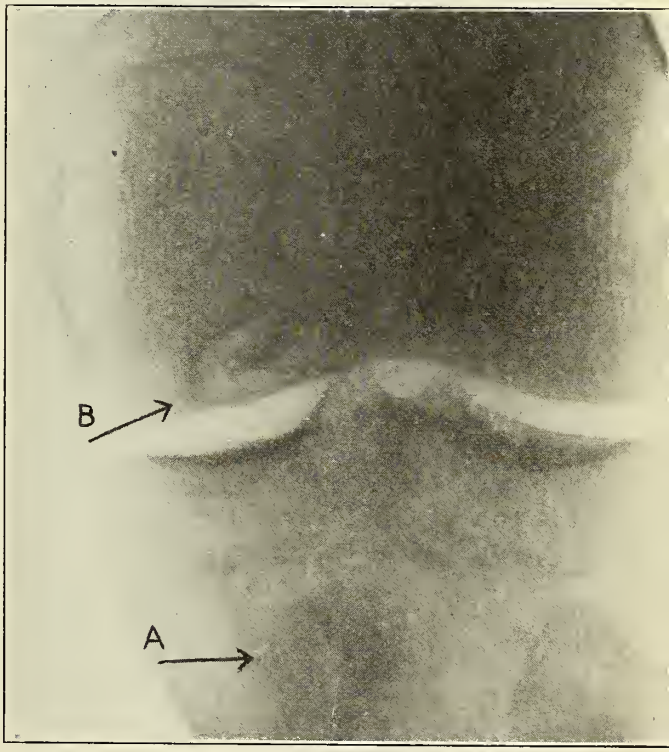

FIG. 3: Case No. 2; (A) A small area of rarifaction surrounded by an area of sclerosis indicating a probable former inflammatory focus in the tibia; this area may represent a past infection and if so may have some bearing on the inflammatory nature of the area at (B) and thus support the inflammatory theory of osteo chondritis dissecans in general. (B) Area of osteochondritis dissecans which later became extruded into the joint. At operation it was found to be attached to the femur by some strands of the posterior crucial ligament.

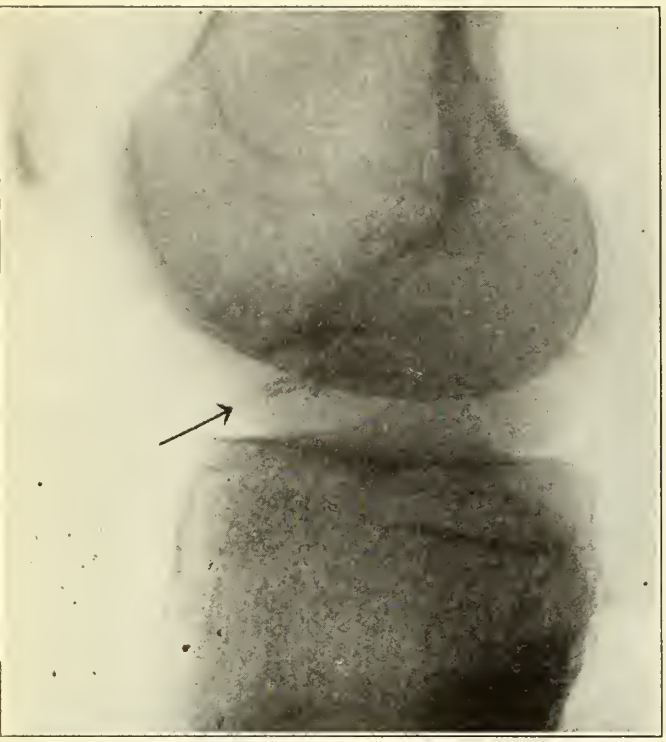

FIG. 4: Case No. 3; One year later than Fig 3.

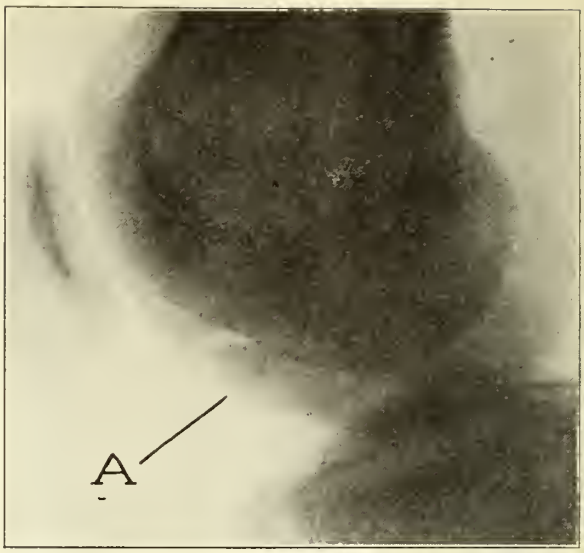

FIG. 5: Case No. 3; (A) the area of bone removed at operation and shown in FIG. 7.

FIG. 6: Case No. 3; (A) The area of bone removed at operation and shown in FIG. 7.

suprapatellar region, at the same time the disappearance of the body referred to as occupying the cavity in the mesial condyle was evident.

CASE 2: Female age 17. No history of injury; complained of pain in the knee, this was more or less constant and had existed for four years. There was neither swelling, tenderness, nor limitation of movement. In a radiograph taken at this time a small lesion much the same as in Case 1, was overlooked and attention focused on a small lesion in the upper end of the tibia. (Fig 3a) There was here a small cavity surrounded by an area of increased density; former experiences having demonstrated areas of this appearance to represent an area of granulating osteomylitis, it was operated upon without relief to the patient. Further radiographic study now disclosed the area in the femur condyle (Fig. 3b) and because of the fear that on opening the joint one might not be able to find the lesion and that again in all probability a loose body would appear and could be removed, a watchful waiting policy was advised. During the interval of a year the patient was seen occasionally and always pain was the only symptom. Finally one year from the first observation and four years from the onset of pain, movement of the joint began to be painful and slight joint swelling was noticed. In a radiograph (Fig. 4) taken at this time the oval area referred to seemed to contain a body and thinking that the new symptom meant that the body was about to be extruded, operation was advised and done one week later, a day or two before the operation severe pain and locking of the joint occurred. At operation the synovial membrane was quite reddened and there was a moderate amount of ropy straw colored fluid; on the joint surface of the mesial condyle of the femur, a defect was found in the immediate neighborhood of

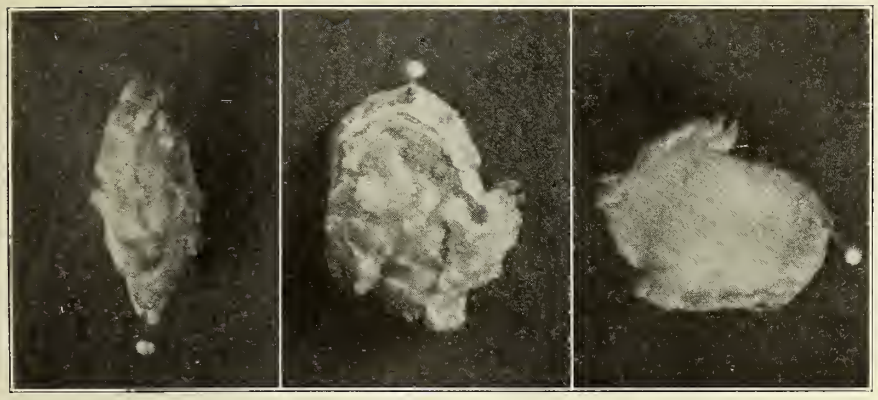

FIG. 7: Showing the area of bone removed in Case No. 3, and shown in FIG. 5 and 6. The view at the left shows the joint surface, that in the center shows the upper surface covered with fibro cartilage, and that at the right shows the thickness of the area removed.

the posterior crucial ligament, this defect was roughly about the size of a nickel, a body corresponding in shape and size to this defect was attached to the lateral aspect of the mesial condyle by some strands of the posterior crucial ligament.

CASE 3: Male age 18. Complains of painful and swollen knee. For six years he suffered from "rheumatism" in this knee, that is he had more or less constant pain until one year ago when he experienced an unusual amount of pain, his knee became swollen and movement painful, these acute symptoms subsided more or less and for a year he suffered only from pain again. The present condition began in the same manner as the attack a year previously; he now has uniform swelling of the joint with considerable restriction of movement. Radiographs disclosed the conditions seen in (Fig. 5 and 6). Experience gained from the former two cases seemed to indicate that because of the change in the symptoms from only pain to swelling and disturbance of function, the dissected bone was becoming more detached. Six years of symptoms and the probability of an indefinite period of disability in the future made one advise operation, although believing that the dissected piece of bone had not become extruded from the bed. On opening the joint there was found a moderate amount of ropy straw colored fluid, the synovial membrane was much reddened. An area of the joint cartilage corresponding in size with the piece of bone and cartilage shown in (Fig. 7) was seen to be of a yellowish white color and was lacking in lustre; at one part of the circumference of this area a small fissure was noticeable in tre cartilage and one now noticed that the entire area was very slightly bulging. Pressure on this raised surface gave one the impression that it was depressible as if resting on a cushion-like bed. An incision was now made in the cartilage on the circumference of the raised area and the piece of bone and cartilage as seen in (Fig. 7) was pried from its bed; in removing it one was conscious of the fact that it still remained somewhat loosely attached at its base. The surface of the bed from which it was removed was indurated, covered here and there with granulation tissue and at the centre of the cavity bled quite freely. The removed fragment was thus doubly convex, covered with joint cartilage on one surface and with an irregular layer of fibro cartilage on the opposite or superior surface, between these areas of cartilage was a thin plate of bone. In the specimen removed in Case 2, there still remained quite a bundle of fibres of the crucial ligament.

CASE 4: Male age 28. Possible trauma eighteen years ago. The present trouble has existed for fifteen years, this consists of a catching pain which lasts a moment or two, during these fifteen years he would have periods where the catching would occur for a week or two and then disappear for two or three months. He is never conscious of pain except at the periods of catching and when at rest there is never any pain. Hyperextension and acute flexion with attempts at outward rotation cause slight pain. There is nothing objective to be found on examination. The radiographic findings are practically the same as in Case 2.

On the basis of these four cases one can

pretty definitely analyze the clinical phenomena and establish the clinical picture of a very definite pathological process, the cause of this process must still perhaps remain obscure, but in analyzing the clinical in conjunction with the pathological there is strong presumptive evidence that it is an inflammatory process and confined to the bone, that is, it is a non-suppurating ostitis, the cartilage is not involved in the inflammatory process but in time becomes fractured and permits the extrusion of the dissected bone.

SYMPTOMS: In all of the cases pain was the only symptom for several years, pain of an aching character and referred to the knee joint; after several years of pain the function of the joint becomes impaired, swelling and limitation of movement more or less persistent or in attacks of varying severity, these attacks at first are not accompanied by characteristic catching or locking of the joint, they resemble more the clinical picture seen in villous arthritis or so called "fringe joints," or in the earlier stages of arthritis deformans. Finally the symptoms present the characteristic picture of a loose body.

Pain alone then is a characteristic phenomenon, there is perhaps no other diseased condition of the joints or of the bone in the immediate vicinity of the joint (for after all this condition is primarily an ostitis) that exists for the same length of time without causing any disturbance of joint function. In Case 2, there was four years of pain alone, in Case 4, 15 years of symptoms, how early the radiograph would reveal the lesion one cannot say, in this case pain had already existed two years before radiographic study was undertaken.

The gross appearance of the removed bodies has been described above, the histological examination showed the hyaline cartilage to be normal in appearance, the bone was also normal, the fibro cartilage was more cellular at its attachment to the bone than at the periphery and in one area a number of well formed capillary tufts were seen running from the bone through the fibro cartilage to its periphery. These four cases represent a condition described by Konig in 1888 as osteochondritis dissecans, he recognized it as a definite pathological process. Since that time there has been a good deal of speculation indulged in as to the cause of the condition, the majority agreeing that trauma is responsible. Ludloff (1908) reporting several cases and accurately describing the condition found on opening the knee joint, lays emphasis upon the fact that in none of his cases could a definite history of trauma be obtained. Being unwilling to give up the traumatic theory he proceeds to theorize further and argue that while gross trauma may not play a part, numerous and repeated trauma unrecognized by the patient may. The lesion is most often found in the lower end of the femur and usually at a very definite point in an area of the medial condyle in the immediate vicinity of the attachment of the internal curcial ligament. Ludloff theorizes that the repeated pull of this ligament may have interfered with the blood supply through an end artery and so a definite area of the bone thus became separted off.

Proceeding to an analysis of the traumatic theory as outlined by Ludloff, we must take into consideration the long clinical course with pain predominating; the separated body has clearly not been deprived of its nutrition because fibro cartilage has grown on the detached surface and the presence of capillaries in this fibro cartilage indicates also a vital process; to assume a separation due to death of the bone, we must assume an aseptic death with the small plate of bone remaining in place as an autogenous graft, most suitably situated for union with the parent bone. To be fair in argument, however, we would have to admit that being attached to the joint cartilage it is possible that almost persistent movement would prevent union and thus allow of the growth of cartilage originating from the hyaline cartilage of the point along the line of cleavage. Once this separated surface becomes covered with cartilage, its union with the parent bone being still prevented by more or less continuous movement, there remains only the hyaline cartilage of the joint to hold it in place; probably because of the growth of fibro cartilage it might be assumed that the separated fragment would be caused to buldge as it were toward the joint and finally lead to fracture of the hyaline plate holding it in place with a consequent extrusion of the fragment into the joint

as a loose body. To follow this process over a period of four, six and ten years respectively and make it cause pain all these years requires a good deal of imagination. As indicated by the title of this paper, the writer leans to the theory that the process is due to an infection and that the symptoms are due to a low grade of inflammation. The clinical and pathological manifestations of infection of any organ or tissue may be of any grade of severity and may become quiescent for varying periods of time both as to action and symptoms. Infection of bone may lie dormant for many years to again resume either an indolent or very active course.

The base of the cavity from which this fragment has escaped was covered by a raw bleeding surface appearing like granulation tissue and the surrounding bone was indurated, this induration was found at operation and the radiographic picture shows the loose body to be surrounded by a ring of greater density than the surrounding bone, these appearances are suggestive of chronic bone infection.

In tuberculosis a large process of bone may disappear without the formation of any abscess, in syphilis, sclerosing ostitis with great pain may leave behind nothing but a scar. In staphylococcus infection there may result a granulating ostitis existing for a long period of time never leading to pus formation but which may eventually lead to small sequestrum formation.

We have then in our cases constant intermittent pain for years, attending a process which eventually separates off a fragment of bone, not a sequestrum; because it is still living, along the track of separation cartilage grows from the hyaline plate of the joint surface, finally bulging toward the joint occurs fracture of the hyaline plate and extrusion of the separated fragment.

Each joint presents anatomical and physiological peculiarities which make the differentiation of injury and disease an interesting and at times difficult task. Perhaps the knee joint presents more puzzles than any other joint, its large synovial cavity with communicating and non-communicating bursae, the synovial folds, semilunar cartilages, crucial ligaments, all furnish vulnerable aspects for injury, this with the numerous diseases common to all joints makes the study of its disabilities quite a problem. When we remember that the early symptoms of many diseases of joints are pain and later limitation of movement the difficulty of early differentiation is evident.

If we cannot assign the cause of the disease, diagnosis, treatment and prognosis are quite as interesting to the patients as the discovery of the etiology. The clinical and radiographic evidences are sufficient to enable us to assure them that the trouble in the joint is a benign one and that in the period when the dissection of the fragment is taking place, both the patient and doctor can, if the pain and disability are not too disturbing, wait with perfect equanimity until the fragment is extruded into the joint. If either pain or recurring inflammatory attacks are severe enough to justify it, operative removal is indicated. The definite location and the appearance of the overlying cartilage should make it possible to find the lesion. Once the fragment is extruded into the joint the problem is that of a loose body. Some people maintain that their loose bodies do not cause sufficient trouble to warrant their operative removal so that here too there must be the individual consideration of the subject.

DISCUSSION

DR. M. S. HENDERSON, Rochester: We have to thank Dr. Colvin for drawing our attention to a group of persons comprising a definite although small clinical entity. Probably the most interesting point is the etiology. Why do these bodies occur? At best we can only speculate. In the first place, we have the traumatic theory. I think we all acknowledge that trauma does play a definite part in the production of these bodies, but it is in itself insufficient to fully account for them.

The thought has suggested itself that these bodies may be indirectly caused by a metabolic condition. We see people quite frequently with brittle finger nails; we see people with brittle hair. Their hair breaks off easily; their finger nails are brittle and break, and why should we not have joint surfaces that are brittle? We get loose bodies in the knee joints, the shoulder joints, the hip joints and ankle joints, although rarely in the hip joints. The knee joint being the largest joint in the body and subject to trauma, may not trauma be the direct cause of these pieces of too brittle cartilage breaking off? The fact that they always come from one place in the knee joint is also interesting. There is great strain thrown on the internal crucial ligament when the knee is in extension, and the constant tugging of

this ligament might have something to do with the injury of the cartilage in the area and its subsequent dessication.

Some of these patients with loose bodies in joints complain very little and they are content to go along and put up with the inconvenience. The mere presence of loose bodies in a joint is not a sufficient indication for their removal unless they give symptoms sufficient to warrant operative interference.

A NEISSER; LUETIC OUTLOOK

By Harry A. Baker, M. D.,
Minneapolis, Minn.

Of all the diseases to which mankind is subject, there are none where the dictum rings so true and is so applicable, prevention is better than cure, than when applied to the venereal diseases; for despite the refinements of diagnosis, standardization of treatment and possibilities of cure, an individual once infected, through ignorance, inadvertance or over confidence, becomes a source of infection, an economic loss and often a menace to the community.

We have seen how futile would have been efforts toward victory should the Spanish Flu have continued its decimations; and we know too how dear and vacuous the price of victory should it have resulted in a destruction of the victor as well as the vanquished. The havoc wrought by the venereal diseases is as grave and the economic loss as great as that of the present pandemic, for besides minimizing the efficiency of soldiers and undermining the strength of citizens, the ravages of Neisser and lues extend to generations yet unborn.

Of these things the profession have been aware for a long time and many have been the attempts, of necessity by indirection, to control the scourge. Two heretofore apparently insurmountable barriers have handicapped all previous efforts: the liquor traffic, antidotal to all civic and moral progress, and a conspiracy of silence on part of press and people in matters of sexual hygiene. Now that national prohibition has come into effect and the press is ready to spread to an eager public, information in connection with activities of the Public Health Service and the Departments of Preventable Diseases of the various State Health Departments, not alone is control a present day realization, but eradication among the Utopian possibilities.

Simultaneously with the declaration of war against Germany, the war department declared war against these microbes. The programme outlined is familiar to us all. It is the plan of attack and the course of action of the joint minds of the men of the country who have individually made a study of the prevention and cure of these diseases and an altruistic application of their art:

1. Abolition of Liquor Traffic.
2. Suppression of Vice.
3. Educational Propaganda in Matters of Hygiene.
4. Prophylaxis in Army and State.

In a word, *A RECLAMATION of MEN*. Until now they have been war measures, but it is evidently the intent, with the return of peace, that they be waged with continued and undiminished vigor, since they are considered as essential to the ascendency and prosperity of a nation as is preparedness, and the big stick, and the discipline and strength consequent upon universal military training. Already the statistical curve shows the beneficity of this programme.

The work of the health boards and the hygiene commissions therefore is Aegean in its magnitude; to be but in part successful must need have the full co-operation of all the doctors of state and country.

The cure of disease per se is but incidental to the good that will be accomplished by propaganda so necessary as a basis for prevention and treatment. The immediate aim is the conservation of our human resources; the ultimate goal is the moral improvement and elevation of the entire nation. The education needed to obtain prevention; the laws necessary to secure control; and the moral discipline, a control and right direction of desires, essential to obtain a cure, all assist in the development of character; and character, in individual as in nation, we are told, is the consummation devoutly to be wished and maintained.

There are several truths about Neisser and Lues which cannot be too oft repeated. Both are preventable. The treatment of both is

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standardized. Uncomplicated Neisser is curable and lues recognized early is immediately made non contageous, perhaps cured; Sterilisatio Magna of Ehrlich, the possibilities of which we are already convineed.

The complications of lues for the most part are cerebro-spinal, an attack of the organism upon the point of least resistanee, and in the strife and stress of the times, it is not surprising that the nervous system becomes the most vulnerable. To my mind, paraluetics—tabetics and paretics—are contemporaneous reminders of the past insufficientism of our science together with inadequate national health measure as prevention; and those of the future will be isolated instanees of escaped or neglected treatment or shoek.

The best treatment is the early intensive treatment and not the least of its advantages is the possibility of discharging patient as cured within the lifetime of doctor or patient.

To those interested in the control of venereal diseases, the outlook for the future is most promising. With civic communities organized and prepared to combat diseases in state and surgeons reporting suecess of prophylaxis in army, Lues should be as seldom seen as Leprosy and as mildly virulent as variola. It was advertising that killed the fly, "Swat the Fly," it was publicity that controlled tuberculosis, it is edueation that will minimize the venereal peril.

DISCUSSION

DR. HARRY G. IRVINE, Minneapolis: I think the time is ripe for a general discussion of this subject, particularly with general practitioners, and I think the association is to be congratulated on having had this subject brought before it by Dr. Baker, not in an effort to give a detailed account of the work which has been done or which is to be done, but simply to bring it up as a general topic of discussion and to suggest a general scheme for control of these diseases and a campaign of education in regard to them.

It may interest you somewhat to emphasize some of the work which has been attempted by the State Board of Health through the Division on Venereal Diseases. There are a number of points which have been brought up at various times by different individuals. Some persons have understood that we had the idea of attempting to eradicate venereal diseases by passing rules and regulations. They apparently understood that this was all that was to be done, that the State Board of Health passed rules and regulations that doctors must report their cases and that was the end of it. Others thought we would give lectures on the subject and distribute pamphlets. The real fundamental principle upon which the campaign has been carried out is that the disease has been attacked from all of these angles. We have attempted to realize that there is good accomplished in preaching morality; that there has been good done by prophylactic treatment; that there has been good accomplished in the educational propaganda, and so on, and we have attempted definitely to coordinate and to correlate this work and carry it on under a definite scheme. It divides itself into four phases: Education, social service work, law enforcement, and medical treatment. Under education effort has been made to reach different groups of people, particularly groups who themselves are concerned in teaching others. For instance, a course of lectures has been given in all normal schools of the state; a course of lectures given to Parents, and Teachers Associations, to public health nurses and school nurses, and to all those people who can carry the propaganda on. We have attempted along the general lines of publicity to get the public generally interested and educated by educating different groups of people, by distributing pamphlets, by the use of films, etc. A story pictured upon the screen has given most excellent results.

The distinctly medical work has been carried on by starting clinics. We have started five dispensaries in St. Paul, Minneapolis and Duluth. The work done in these dispensaries is being financed through a federal appropriation which the state received a few months ago, and these clinics provide adequate service for a number of people who could not go to the clinics in daytime, and for people who are working and earning money sufficient to support their families but not sufficient to pay the fees necessary to bring about a cure. Many of these people have been separated from the quack and faker. We have attempted to advertise in the same columns of the newspapers as the quacks and have tried systematically to catch the interest of these patients, telling them that the quacks are ever ready to extract their money, and advising them to come to the dispensaries to be treated free if they cannot afford to pay.

At the evening dispensary for men at the University of Minnesota, which has been going on for two or three months, there were fifty-seven patients one night. There is also a dispensary for women which is conducted at the City Hospital. In St. Paul two dispensaries are running. The attendance at all of these clinics is anywhere from twenty-five to fifty at a session, and many patients that are coming to these dispensaries have been bunkoed out of their money by fakers and have attempted self-treatment with medicines procured at drug stores.

We hope at some future time to institute an advisory clinic to which the general practitioner who has not the equipment for early diagnosis, may send his patients for nothing or for a nominal fee to be

examined for Neisserian infection and Spirochetes or to have diagnoses made, and have the patients referred back to the physician for treatment. This would be of great assistance to the general practitioner and an immense benefit to the patient.

We have stimulated law enforcement in various communities. We believe that the suppression of prostitution has a definite effect upon venereal diseases. The records appear to prove this conclusively.

We have attempted to institute quarantine where necessary, and then follow it up by the social service department workers. The social service work is new, and a great many general practitioners do not clearly understand it. It is hard for many men to realize that an outsider as the social worker appears to them, can help them handle their cases. This social service work has brought that phase of the the question to the attention of a great many men, and probably twenty different communities have had the opportunity to see what can be done in bringing back delinquent patients and finding out the sources of infection. The social service department picks up and brings cases for examination; we try to find out the sources of infection; delinquent patients are followed up, and we follow up cases going through the workhouses. Up to the present time there have been approximately one hundred and fifty lectures given, with an attendance of forty-five thousand people. The film "Fit to Fight" most of you have seen, this film has been shown to five thousand persons. The new film "The End of the Road" has been shown to about fifteen thousand people. The steromatograph, an automatic picture machine used in industrial plants, has been viewed by ten thousand people. We have distributed approximately forty thousand pieces of literature. There has been no particular effort made to hand out this literature; it has been furnished on a written or personal request or in connection with lecture work where persons have asked for it at the time of the lecture.

As to the number of cases reported, we have had reported up to January 1st of this year about 1600 cases of syphilis, 1800 cases of gonorrhea, and 70 cases of chancroid. These reports have come from 350 doctors and from 89 different communities of the state; 125 sources of infection have been investigated and brought under treatment. From May 18 of last year 742 cases have been investigated. These were sources of infection, cases referred from the workhouses, or cases reported as delinquent patients, or reported for some other reason for special investigation.

DR. F. R. WRIGHT, Minneapolis.

Mr. Chairman: Venereal diseases should be placed in the class which we call communicable diseases. There is no question that the spread of all communicable diseases can be prevented. As to how to prevent this spreading there are two methods of doing it. One is by control; the other is by education. At the present time we have a great propaganda to control these diseases. The Army presents figures which are misleading because they are figures that apply only to the Army. All cantonments have been located in small communities, where there are comparatively few prostitutes, and where prostitutes cannot find lodging suitable to their vocation. The men are under absolute orders. They are told, if they contract venereal disease, they become disgraced; their names are put on the Army records; their pay is stopped, and all liberties are taken away.

Outside of the Army there is no control. Every individual is governed by his own sweet will and opportunity. Our State Board of Health is undertaking to educate the general public. In spite of the work they do, and the instructions they give, people cannot be educated to lose their sexual desires, and there is no use undertaking it. People have always had sexual intercourse, and they are going to keep it up. Educate them as you may and they will not give up this ancient custom.

Work similar to that which our State Board of Health is doing at the present time was done long ago. A meeting of men, interested in the control and treatment of Venereal diseases, was held in Copenhagen, Denmark in 1873. If those who are interested will look up the American Journal of Syphilis for January, 1874, they will find a report of this meeting made by a man appointed by the American Medical Association. This report shows tha all questions of our present propaganda, except the reporting of diseased men, were considered at that time, and that Finland reported that after 25 years of work against Venereal diseases, during which time the Government had furnished free treatment to all patients applying for it, Syphilis and Gonorrhea were on the increase.

Dr. Irvine reports the number of lectures given by the State Board of Health, and says that 25,000 women attended these lectures. What does this amount to? In my opinion very little. I had my stenographer, unbeknown to the State Board of Health or to the lecturer, take down one of these lectures. This was a noon day lecture given to the working people of Minneapolis. She came back a most disgusted woman. You should read her report of that lecture. It was simply "rot."

The other side of the education question is this: There are not 20 physicians in the State of Minnesota who are competent to treat Venereal diseases. There are not 20 men, of 2200 physicians practicing in the State, who know the pathology of Gonorrhea. There are few diseases whose clinical symptoms, when understood and accurately interpreted by a knowledge of the pathology present, indicate treatment as clearly and as accurately as those of gonorrhea. Yet physicians will not take the trouble to learn this pathology, and to interpret these symptoms. Physicians are not honest enough with themselves, or with their patients, to admit they do not know venereal diseases, and to send these patients to someone who has made a study of these conditions. There are men sitting in this room who have

treated case after case of gonorrhea as long as the man could afford to pay. When the man can no longer afford to pay, or when he becomes dissatisfied with the progress made, they have sent him to somebody else.

The thing that controls disease is the thing that cures that disease. You cannot control venereal diseases until you can educate the Medical profession to know something about these diseases, and stimulate their interest to give these people proper care. The average practitioner will not examine the urine or a slide in making the diagnosis, but will write a prescription, which he learned from a text book 25 to 30 years ago, and charge the young man ten dollars. The next patient this physician sees will probably be a dirty laboring man. He will take time to have this man stripped and examined from head to foot, spend one-half to three quarters of an hour, and charge him two to three dollars. He cannot see any dishonesty in this practice. As a matter of fact he makes a victim out of the boy who has been so unfortunate as to acquire gonorrhea. He goes on the theory that the young man has had his pleasure, and he should be allowed to pay for it.

An educational campaign has been going on in this State for the control of Venereal diseases. The average doctor does not know as much about gonorrhea as the fellow that has had it three or four times. The law provides that the State Board shall chase up the patients reported to them, and force them to go to some doctor. It, however, makes no requirement that the doctor to whom these patients are sent shall know anything about Venereal diseases. He must be a doctor—that is all. The doctor who undertakes to treat these cases ought to know something about them. If he does not, he should have personal honesty enough to admit it, and to send them to somebody who will take the proper care of them.

Dr. Baker spoke of lessening the complications of Venereal diseases, In reply to this I want to say that the complications of venereal diseases will be lessened when the Medical profession learns to treat these diseases, and not until then.

I want to correct one statement in regard to chance in connection with spinal syphilis. I do not think chance has much to do with it. As long ago as 1900, Professor Neuman of Vienna, taught that because syphilis runs a definite course, the same as other infectious diseases, it must be due to some definite infectious agent. That there must be three species of these infectious agents, whatever they are; because certain cases develop lesions of the bone; certain cases run their course in the skin and mucous membrane, while other cases are attacked in the nervous system. Seldom do we find the three running together. The man who has syphilis of his nervous system has had a light early syphilis. Syphilis of the nervous system is rarely ever accompanied by gummata. Since we know the cause of syphilis, and can get the spirochaeta under the microscope and study them, we find that they present certain variations. In certain specimens, not in all, we find spirochaeta which will run in one direction across the microscopic field, then suddenly reverse its motion and run backward. In other specimens we do not find this form of spirochaeta. It is now believed by investigators that this form of spirochaeta, which has the backward and forward motion, is the one which attacks the nervous system.

DR. BAKER (closing): It is agreed that the work of the State Board of Health is an old programme. In ancient times hygienic laws were interwoven with those of religion; for what reasons we may draw our own conclusions. If today there are any about who have no regard for religion and know no fear of infection, it would seem well to enact health laws and insist upon respect for law. I thank the doctors for their generous discussion.

THE EARLY DIAGNOSIS AND TREATMENT OF ACUTE INFLAMMATIONS OF THE EYE*

By E. W. Benham, M. D.,
Mankato, Minn.

Observation of patients with acute inflammatory diseases of the eye leaves the impression that in many instances pain, loss of time and disability might be materially lessened if the advantages of early diagnosis and appropriate treatment were more generally recognized.

Diseases of the character described occur rather frequently, are usually first seen by the family physician, and it may be worth while to consider a few general principles bearing upon their management in the early stages. Some of the cases are self-limited and would do well under almost any treatment; others, while apparently mild at the outset, may soon become severe, pathological changes supervening which later treatment may be partially or wholly unable to remove. To serve such patients well involves a definite diagnosis and a conception of the pathology underlying the disease, to the end that the treatment advised may not only meet the immediate situation but prevent later unfavorable developments.

There is perhaps no class of diseases in which the correct management of the early stages counts for more than in the one under consideration. The eye responds acutely to all forms of irritation or infection, and inflammatory

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changes take place rapidly. In acute iritis, for instance, plastic exudates are thrown out by the vessels of the iris, and if not prevented by treatment, adhesions form, fixing the iris in contact with the capsule of the lens. Vigorous treatment, applied early, usually limits or prevents these adhesions; the same treatment, undertaken some days later, often is ineffective, in which case the pupil becomes partially or completely closed, the intraocular tension may rise, inflammatory symptoms persist, and the disease is likely to run a tedious, painful course, terminating in more or less damage to the eye.

In acute glaucoma the time element in diagnosis is of even greater importance, as the high intraocular tension, if not relieved, quickly injures the optic nerve, with resulting blindness. Vision fails rapidly in these cases. If medical treatment is used and does not promptly improve the situation, operation is required. It is often a matter of hours, rather than days.

The above facts suggest the importance to the patient of a definite early diagnosis, and that the treatment adopted should be based upon the pathological possibilities of the disease rather than upon its clinical appearance at the moment.

The commoner diseases encountered in which confusion of diagnosis is likely to arise are acute glaucoma, iritis, and ordinary acute conjunctivitis. Until these diseases are carefully differentiated, no intelligent treatment is possible. Usually the diagnosis is not difficult, if the principal symptoms are kept in mind and the examination systematically made. Remembering a few important points, one disease at a time can be excluded until it is definitely known that a diagnosis can or cannot be made.

Those accustomed to making eye examinations are aware that acute glaucoma is relatively not a rare disease; they further know that little safe progress can be made in the conduct of the case until the presence or absence of this disease is determined. The one striking symptom of acute glaucoma, easily recognized, and not seen in other acute inflammations of the eye, is the dilated pupil, which is decidedly larger than that of the unaffected eye. This dilated pupil is a danger signal which cannot be safely disregarded, and a diagnosis that does not account for its presence is open to question. The vision is profoundly affected; sometimes only perception of light remains at the end of a few hours. Palpation of the affected eye will show it to be decidedly harder than its fellow. These three symptoms of acute glaucoma are easily remembered, quickly determined, and, if present, at once put the patient in a class requiring prompt action if vision is to be saved.

Having eliminated acute glaucoma, it should be determined whether the patient has iritis or conjunctivitis, and to do this careful observation of the appearance and behavior of the pupil is necessary. The dilated pupil of acute glaucoma is not found in these latter diseases. In searching for evidences of iritis, we examine the pupil closely as to its circularity. If it is not perfectly circular, inflammatory adhesions probably have taken place between the iris and the lens, altering the shape of the pupillary opening. With a good light these can generally be seen. If doubt exists, the pupil should be dilated, when, if adhesions have formed, the pupil, as it dilates, commonly takes a more or less irregular shape, the iris remaining adherent to the lens capsule at one or more points. In mild forms of iritis the pupil upon dilatation may at once become perfectly circular, but even in these instances the ophthalmoscope usually shows pigment spots upon the lens capsule, at points where the inflamed iris had been previously attached. The color of the iris is often dulled by the inflammation. Vision is not much affected in the early stages of iritis; later, if there is an accumulation of inflammatory exudates, the vision becomes impaired.

The use of any drug which dilates the pupil is highly dangerous in acute glaucoma, hence we have here an added reason for first excluding this disease—that we may be free to dilate the pupil to determine whether evidences of iritic inflammation are present. If nothing is found, the dilated pupil is merely a temporary inconvenience.

There is a form of iritis sometimes called 'quiet iritis', from the mildness of the symptoms, which is accompanied by very little or no pain, or inflammatory reaction, not much complaint being made except that the eye waters and is irritable. These cases will be

overlooked, and will be treated as something else, unless careful examination is made and the pupil dilated, when adhesions or pigment spots will generally be found.

Having by the foregoing procedure excluded acute glaucoma and iritis, we may conclude that we are dealing with acute conjunctivitis.

As aids to diagnosis the patient's subjective symptoms are helpful. Acute glaucoma and iritis are usually accompanied by severe aching pain, often felt in the brow or temples, while in conjunctivitis the sensation is rather one of smarting, burning or scratching. Severe pain, therefore, suggests the probability of something more than inflammation of the mucous membrane. The discharge in iritis and glaucoma is thin and watery; in conjunctivitis it is more profuse and muco-purulent, and accompanied by decided evidences of inflammation of the mucous membrane of the lids.

Briefly then, the purpose of the examination of an inflamed eye would be first to exclude acute glaucoma by recalling the dilated pupil, badly impaired vision and increased tension of the globe, which identify it. If glaucoma is absent, this may be followed by careful inspection of the pupil for adhesions, dilating it if necessary, to determine whether the inflammation is due to iritis or to conjunctivitis. An examination made somewhat after this manner should furnish helpful evidence as to the presence of serious disease, and afford a better ground upon which the patient may be advised as to the further management of the case.

It is, of course, not to be assumed that the above comparatively simple procedure exhausts all means of diagnosis. Only the essential steps are mentioned necessary to be taken to arrive at even a provisional diagnosis. If the examination in this manner leads to no definite conclusion, the patient should be given the benefit of consultation and more comprehensive examination.

Mention should be made of the occurrence of iritis, conjunctivitis, and occasionally glaucoma as complications of other diseases and injuries of the eye. This happens frequently and is unfortunately often overlooked. For the purpose of treatment it is highly important that these complications be recognized. This is noticeably true, for instance, in such conditions as traumatisms of the eyeball and corneal disease. In ulcer of the cornea the toxins penetrate to the aqueous, exciting an iritis which, if untreated, retards recovery and leaves the pupillary region filled with exudates and adhesions.

It is not uncommon for traumatism to precipitate an attack of acute glaucoma. In fact, glaucoma, or at least increased intraocular tension, which is the first stage of glaucoma, occurs in so many conditions affecting the eyeball that good management requires it to be kept constantly in mind.

Conjunctivitis as a complication, if untreated, is not so disastrous as is the case with iritis or glaucoma, yet its suitable treatment hastens the recovery of associated diseases.

With reference briefly to the treatment of acute inflammatory diseases of the eye, there are some authorities who mention good results from the use of such drugs as eserin and pilocarpin in acute glaucoma. My own experience with medical treatment in this disease has been disappointing, and operation has been found necessary. However, this may be due to the fact that the patients have not been seen early enough. The effect of early operation is so satisfactory in acute glaucoma that it would scarcely seem justifiable to jeopardize vision by delay, unless medical treatment gave decided immediate improvement.

In iritis, the one most valuable factor in controlling the disease, occurring primarily or as a complication, is the use of atropin. The pupil should be dilated to the maximum at the earliest moment and the dilatation continued. This relieves the hyperaemia, controls pain, and limits or prevents damage due to adhesions and exudates in and about the pupillary space. The addition of dionin is helpful. Heat, salicylates and mercury all have their place. Constitutional disease must be cared for; and, in accordance with present views of etiology, diseased teeth, tonsils, or other sources of focal infection should receive suitable treatment. The severity of the symptoms will depend to a great degree upon the stage at which the diagnosis is made and the treatment begun.

Ordinary acute conjunctivitis, which is the only form considered here, usually responds

readily to treatment with boric acid, zinc, silver preparations, etc. Other types require management according to their etiology and the conditions present.

In conclusion, it will be observed that the presentation of this subject contains nothing new. Certain symptoms and refinements of diagnosis, bacteriological and otherwise, have been intentionally omitted, the purpose being merely to suggest to those who may feel interested, the obvious advantage of deciding the diagnosis and treatment at an early, rather than a late, stage of these diseases, and to commend the use of a few simple steps in diagnosis. Early diagnosis and suitable treatment will prevent blindness in a certain percentage of cases, and will shorten the course, modify the symptoms and improve the end results in many more.

MEDICINE, FORTY YEARS AGO; GLANCES IN RETROSPECT, AND SOME NOTES OF COMPARISON WITH LATER PERIODS*

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As one who still claims some vested rights in his profession, I realize that acuity of vision depends, in no small measure, on daily and actual contact with modern progress. Consequently, when requested to address you it seemed more fitting, to me, to attempt something that had formerly employed my greatest energies and held my deepest interest and concern. Hence this caption, and, therefore the sequel.

It is obvious that any retrospect of medicine dating back forty years that I am permitted to present to you at this time, necessarily must be both cursory and casual and only in a narrow sense analytical.

The picture I have attempted to draw is almost entirely from memory. Therefore I hope you may grant me your indulgence should it prove none too clear.

I would say also that it is of the country rather than the city I have dealt, but it is a fair presumption that the difference is one of degree rather than of fact.

Going back to my pre-graduate days it might invoke your interest to consider the status of medical education in existence in this country at that time. The number of really first class schools was small, in comparison with those conducted as commercial ventures and the nondescript class to which it would be sheer flattery to refer in any other terms than mere diploma mills.

Preparatory education, even among the foremost schools, was largely a matter of personal judgment on the part of the aspiring student. True, a certain number were well equipped with full college attainments while it was equally true many others possessed but little more than a common school preparation, with all its limitations.

The time spent in the medical schools varied from five to nine months, during a period of two years, prior to 1880. At that time there was no Association of American Medical Colleges to prescribe entrance requirements or necessary periods of study, and the very few states possessing medical laws were lax in their requirements and enforcement. Later, when several of the states enacted laws to regulate the practice of medicine many men were enabled to obtain a license to practice, based on recognized claims that they previously had been practitioners of medicine for a certain number of years, even though they had spent only a few months of study in a medical school, and never possessed an M. D. degree. Occasionally I note, even at this date, in the obituary columns of the A. M. A. Journal, where some old-timer has passed on to his reward and, in lieu of stated college degrees, his record stands "licensed to practice"—a solemn commentary on by-gone days.

The curricula of the schools were based on such fundamentals as: Anatomy, Physiology, Chemistry and Materia Medica which were regarded as didactic studies. Practice of Medicine, Surgery and Obstetrics were considered clinical or practical chairs in the faculties. Adjunctive to these latter three were; Pathology, Ophthalmology, Gynaecology and Medical Jurisprudence. There were still others but as they received only minor attention we

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will omit their enumeration. I would have you mark well, however, that Biology and Bacteriology held no place in the teachings of those days.

The various chairs were held, in most instances, by men devoting most of their time to the active practice of their profession.

The newness, extent and growth of our country constituted a great demand for physicians and in large measure accounts for our former low standards in medical education, as compared with these of Europe for the same period.

Having thus briefly referred to the opportunities for the mental equipment of medical men of forty years ago, some interest will also attach, perhaps, to an equally brief consideration of the physical aids and appliances at their command.

The means of locomotion and transportation available for the doctor in towns, villages and country districts consisted of the "doctor's gig," his trusty horse and saddle bags and not infrequently "Shank's Mare."

The public's means of "calling" for, or communicating with medical aid was almost entirely by messenger.

The condition of the roads was variable, according to time, place and the seasons. They were never good, seldom fair and frequently only passable for the equestrian or pedestrian.

With such means of communication between physician and patient, it should not be difficult for you to imagine the perplexity of the former or the anguish and suffering of the latter, at opposite ends of interminable miles of infernal roads. Perchance it is the dead of night and only an uninformed and unimaginative messenger to direct the way, often without ability to shed enough light on the case to afford a long range diagnosis.

The doctor's office was usually in his residence or an adjoining annex, and his wife, frequently, in addition to her domestic duties, acted as office girl, nurse and assistant, and during her partner's frequent absence on visitations, as counselor, sympathizer and all-round entertainer.

Not infrequently the village drug-store had back rooms that were official headquarters for the M. D. and many a quiet game of "draw," but "tell it not in Gath."

The office was seldom a thing of beauty and order. A few tomes of ancient medical lore might grace some small shelf, while larger ones held the drugs from which the doctor's prescriptions were personally compounded. It was innocent of the pervading presence of the ubiquitous revolving nebulizer of later days; unadorned of nickeled sterilized apparatus and shiny, showy suggestive surgical tools; and ungraced by the sedate uniformed modern nurse. In fact it was a composite—a place of homely utility, a den for leisurely hours.

It would be a slight to history as well as rank injustice to the doctor of the old school not to mention his armamentarium in some detail; to show its paucity, indicate the handicaps and, withal, to afford comparison with his more modern and favored brethern.

In the matter of drug therapeutics there was an enormous range, for many drugs and remedies had, with tortoise feet, come down the centuries and clung to the pharmacopoeia, with the tenacity of barnacles, unpurged by scientific pharmaeology. There was one heavenly boon, however, freedom from the pernicious activities of advertising Manufacturing Pharmaceutical Companies and proprietary medicine concerns, with their bold claims—garbed in pseudo-scientific fustian—claims that are an insult to an enlightened profession and as unsubstantial as those of some voodo doctor.

Pardon the digression but, with many others, I feel deeply resentful at these gratuitous insults to the intelligence of the modern medical man, by these bandits in our midst, with their unveiled insinuations that most of us have no initiative or ability to think for ourselves, when entrusted with the precious care of our patients. The known weakness of certain members who court such advances, instead of repelling them, should only add to our general loathing.

Having thus hurdled the years, we must retrace our steps. With a multitudinous pharmacopea, a vague uncertainty as to efficacy, chemical and physiological action and reaction, it is understandable how the shot-gun prescription had such a wide vogue. It was comparable to our modern machine-gun fire. Surely some of the numerous missiles must hit the seen or unseen foe. The hard-headed practitioner however was inclined to depend on a few drugs and

remedies that clinical observation and experience had taught him were fairly sure of producing desired results. Those were, truly, the days of clinical medicine. Practice was mainly based on bedside observations and a limited knowledge of physiology and gross pathology. Laboratory experimentation and observation were conspicuous by their absence, in the main. The body fluids and secretions were exempt from anything serious in the way of analysis, on the part of the practitioner. Occasionally the urine was tested for albumen and sugar and the sediment searched for casts, whose true significance was infrequently understood.

No physician's outfit was complete without a few pairs of dental forceps, for, that early specialist in surgery, the dentist, was much of a rara avis, outside of the larger towns and cities. The turnkey, in company with the phlebotomy lancet and the leach, were already as dim spectres on the horizon of the past, while the cupping apparatus still maintained an uncertain existence.

For all auscultatory purposes the single-tubed wooden stethoscope still held sway. The binaural made its appearance during my school days. The clinical thermometer preceded the binaural stethoscope by a few scant years, but was still so much of a novelty that it was often produced with a flourish that attested pride of ownership in an instrument of real precision.

Obstetrics and gynecology called for something more than bare-handed recognition of their importance by the enterprising practitioner and this was manifest in the ownership of O. B. forceps and a cylindrical vaginal speculum.

Some closet or box contained all of the doctor's improvised or other antiquated fracture splints.

Other physical aids and instruments of more or less minor importance might be enumerated but we will content ourselves with final mention of the time-honored amputating case by means of which nearly all of the surgery was done and without which no medical man could consider himself fully equipped. It was the complement of the family bible in the home and about as often referred to.

In those days among all the handicaps that impeded the physicians work, complete lack of trained female nursing, the bacteriological laboratory and the scarcity of hospitals were the greatest. Throughout the country there were only a small number of hospitals and these were almost entirely in the cities. Their standing, in public esteem, was very low. The causes for such unpopularity would now be easily understood and as easily removable. Then they were largely ineradicable, because they were not understood. Science had not advanced sufficiently to permit of their discernment and removal. Perhaps no better opportunity will be afforded to review some of the causes of inefficiency and unpopularity of the hospitals of but little more than a generation ago.

The structures themselves were unprepossessing to the eye and extremely inadequate as to service and comfort. The hospital architect was only one of the innumerable variety of specialists of to-day that had never been heard or thought of, in that age. Sanitation and Hygiene, with all that their august names imply, were not yet out of their swaddling clothes. Antisepsis, that mighty progenitor of asepsis, disinfection and sterilization, godfathers, all, to every branch of modern surgery—was heralded to the world, about 1883, by Joseph Lister of Edinburgh, afterwards Lord Lister of London.

Segregation and isolation were more honored in their breach than observance, their application being confined to diseases of established contageonsness. The names Domestic Science and Dietetics held no scientific meaning and therefore no assigned place in organization. Such nursing as prevailed was untaught or self taught only. The presence of trained and graduate female nurses would have gone far in compensating for all other short-comings, deficiencies and inefficiencies but the curtain had as yet not been raised for their appearance on the stage.

If you will at this time permit me, I would like to express my appreciation by saying that apart from Motherhood, her divinly appointed mission on earth, there is no sphere where woman more preeminently shines than in her trained ministrations to the sick.

The medical staff was well organized and generally efficient in only a comparative few of all the hospitals.

Perhaps this incomplete recital will suffice to show why the hospitals were unpopular—so unpopular, in fact, that there still remains to-day

a dread in the minds of some timid few who continue to bear the seeds of an earlier distrust. Meanwhile we must remember and justly concede—men may not be charged with ignorance if fairly possessed of the wisdom of their day and generation.

A while back I spoke of the handicaps to the practitioner, because of lack of trained nursing and hospitals; withal we may conceive, how much better and with greater ease and comfort for himself he might have cared for his work had the hospital facilities of the time been available to him.

Time presses and we have not yet seen our doctor really at work. Let us accompany him to the bedside of a few hypothetical patients.

Case No. 1—Has been diagnosed ague or malaria on the symptomatology with scant reference as to history, beyond acknowledging residence in a miasmatic environment, which has yielded the paludal or *marsh miasm,* which is held accountable as the causative agent. Treatment: Preliminary and generous dose, or doses, of calomel, to be followed by quinine, in daily amounts of 20-60 grains, for an indefinite period.

For some time the profession had been hearing more or less about the possibility of protozoan causation in the development of malaria, but it was not until 1885 that the plasmodium malariae was definitely announced and later the infective mosquito (anopheles) fixed upon as the real communicating agent. The fogs obscuring a definite etiology have been dispersed while the treatment has not been materially modified, because time and more accurate scientific observation have established its reliability and soundness.

Case No. 2—Patient prostrated with marked evidence of an acute abdominal pathological condition. Etiology; unassignable. Symptomatology; abdominal pain, of more or less acute onset and not well defined as to locality; tenderness, but, apparently, not localized; temperature and pulse not greatly disturbed or far from normal; digestive tract, nausea and some vomiting with bowel somewhat confined; some tympany. Diagnosis; Uncertain; probabilities acute enteritis ("inflammation of the bowels.") peritonitis, perityphilitis, or early stage of intestinal obstruction. Treatment, palliative and expectant.

Many of you, I am sure, will say, "Why these are the 'earmarks' of a case of acute appendicitis and at least a differential diagnosis should not have been diffieult." But hold your fire and please remember, it is an act of grace to be charitable and an important part of wisdom to be logieal. Consider that in the days when our doctor studied anatomy, the appendix was noteworthy only as a "vestigial remanent" and he never heard of it again. Also, that he quite probably had never viewed the abdominal interior of a living subject. Further, that it was not until about 1888 that Fitz of Boston made it clear to all of us that it was the appendix and not the caecum that was responsible for tenderness, tumefaction and pus in the right illiac region. It was still later that McBurney gave us the geographical boundaries of the appendix, so to speak.

Case No. 3—Phthisis, or pulmonary consumption. History: One or both parents or one or more brothers or sisters living in the same household had died of the disease. Etiology—various theories have been advanced, but no actual facts established, as to the real causative agent. Symptomatology—as usual for a case in the middle stages. Diagnosis: phthisis—based mainly on perenssive and ausenltatory findings, together with loss of weight, night sweats and hemoptysis. Treatment: Cod liver oil, expectorants and croton oil painted over the upper portions of the ehest. Advisory—chest protection, avoidance of dranghts and eold night air and strenuous or exciting things that might induce hemorrhage and by no means must the patent be informed that he has "consumption". His natural hopefulness must be humanly encouraged. No admonitions, of course, as to care and disposal of sputum or the communicability of the disease.

It may be well worth while to consider, in this relation, the respective positions of the medical practitioner of then and now. I will quote you briefly, from the text book on Practice of Medieine published in 1881 that we, as students in our school mainly used:

"Primary tuberculosis depends on a peculiar diathesis, often inherited, but not infrequently acquired, is liable to be produced by unfavorable hygienie conditions; but that more or less of this tendency exists wherever true tubercle

occurs. Whether this tubercular material is possessed of specific germs, capable of being communicated as a contagion, is at present undecided.'' In 1882, Robert Koch announced the discovery of the tubercle bacillus.

Many of you will remember how we continued to cling to our antiquated ideas and long denied or refused the light that was thus shed on this terrible malady, cryptic hitherto as to origin and transmission. How we refused to believe in the modern methods of prevention, amelioration and cure. I well remember in reading, many years ago, Maudsley's Gulstonian Lectures delivered in 1870 on ''Body and Mind'' the following; ''We cannot help thinking of the strange hopefulness and the sanguine expectations of the consumptive patient who, on the edge of the grave, projects without a shadow of distrust what he will do long after he will have been 'green in death and festering in his shroud.' ''

This naturally connotes two ideas; universal observation of a mental phenomenon that was as common as the disease itself and, in contradistinction, the hopelessness with which the physician was prone to view such cases.

Case No. 4—Vaccination against smallpox. Operation: scarification without preparatory cleansing, and inoculation with virus obtained from the scab of another patient. I cite this hypothetical case mainly to show that this was the only disease where the physician knew how to exercise preventive medicine by introducing into the blood a vaccine substance that would act as an assured prophylactic. Also, how his innocent ignorance of sepsis has made it painfully difficult to practice this beneficient measure down to the present day. Verily, even in the midst of much education and enlightenment such mental obliquities as prejudice and superstition die a lingering death.

With these few imaginery and perhaps illy chosen cases, it might be of profit, certainly of personal interest, to continue with our old time friend to observe his work and share in his reflections. I wish we might be permitted to extend our observations with him to his cases of typhoid fever, typhus fever, diphtheria, tetanus, cholera, bubonic plague, syphilis and others whose etiology and, to some extent, pathology were as sealed books and treatment, of necessity, empirical. How gladly would we sympathize with him in his searchings after the truth and humbly would we confess our present-day light and opportunities.

You will have inferred, and properly, that the old-time practitioner had to do most of his work alone. He sometimes consulted with a brother practitioner, if he was available, and sometimes called in the surgeon or ophthalmologist, but generally, because he must, he depended on his own resources and abilities. If he was ''worth his salt'' as we say, he succeeded remarkably well considering his day and generation.

I believe the general practitioner continues today to hold the premier place in the medical profession, notwithstanding the rapidity with which specialism has come to the forefront. The specialists quite naturally migrate to the cities. In the towns and small cities ''group practice'' seems to have an increasing vogue and, perhaps, not illogically. But who will care for the villages and countryside that contain the greater share of our population? The general practitioner, of course. Therefore, let us see to it that he is fully prepared and equipped for his multifarious duties. All-round work develops the faculties of the man who thinks as he works. Specialism, begun in early life, often has a dwarfing effect.

I noted the other day where, recently, our old-time friend Dr. Osler was apparently an important participant in certain dialectics concerning the humanities and science. On the question of science he said, in part: ''The extraordinary development in modern science may be her undoing. Specialism, now a necessity has fragmented the specialties themselves. The worker loses all sense of proportion in a mass of minutiae. Applying themselves early to research young men get into back waters far from the main stream. They quickly become hypercritical and the smaller the field the greater the tendency to megalocephaly. From over specialization scientific men are in a parlous state.'' When it comes to thinking and saying what he thinks, Osler is one of the peerless men of our profession.

Personally, I would ask what tends to promote specialism? Is it an ardent love for concentrated study and effort, backed by an altruistic feeling that work conscientiously done is sure of

a fair reward; or is it commercialism, combined with a desire for minimized labor? Doubtless the true answer may be found within the question itself.

A word as to the social status of the doctor of the old school. His was one of the only three learned professions, recognized as such—Medicine, Law and the Church. He was untinctured with commercialism. He was devoted to his work, which he pursued with a singleness of purpose, characterized by a broad humanity and a charity known of all men. There were few men in his community who so widely shared the trust, confidence and love of his numerous friends. For a further magnified appreciation, I would confidently and particularly refer you to Balzac and his "Country Doctor"; likewise, to Ian MacLaren's "A Doctor of the Old School."

Perhaps you would have preferred to peer into the future, or more tersely have cultivated the present, rather than to have so lengthily delved into the past. Be that as it may, it is not all of progress in medicine to neglect the past, for enduring reputations have, not infrequently, been largely gained by harking back to the laborers of other days, some of whom barely missed permanent renown, either through unwisdom or inefficient means for completing their work.

It might be a fortunate thing, indeed, were we possessed of a medical Kipling, who would write for us a periodical "Recessional"—"Lest we forget, lest we forget."

DIPHTHERIA "T. A."*

By Carl B. Drake, M. D.
St. Paul, Minn.

Almost a century ago Bretonneau first recognized diphtheria as an entity among the various forms of sore throat and gave it the name diphtheria. In 1858 the name was first used in the vital statistics of New York City and immediately after this the mortality rate for diphtheria began to markerly increase as such diagnoses as inflammation of the throat, sprue and angina began to be recognized as diphtheria and so reported. In 1883 Klebs discovered the rod-shaped bacillus and a little later Loeffler's experiments with guinea pigs proved them to be the etiological factor and the entity of the infection was established. Finally membranous croup has slowly and rather painfully come to be recognized as a form of diphtheria.

With the introduction and general use of diphtheria antitoxin in 1895 came a sudden drop in the death rate which has gradually continued as the antitoxin has won for itself universal recognition and as general use as any equally conclusively proven specific remedy ever will. The death rate in New York city alone was cut in one year from 158 per 100,000 in 1894 to 105 in 1895 and this rate has gradually been reduced to about 21 (officially 21.4 in 1910) probably thru the serum alone.

In spite of this marked reduction the deaths from diphtheria in New York City alone averaged 1,258 for the years 1913-15 and in the United States the yearly average recently has been 23,540. In New York the figures for the years 1901 to 1917 showed that 77 per cent of deaths occurred in children under the age of five. In spite of culturing, quarantine, the use of serum both as a curative and prophylactic measure this malady exacts a toll equaling that of scarlet fever and measles.

To meet this situation considerable work has been done notably in Germany and this country in an endeavor to find a means of producing an active immunity in human beings.

Injections of diphtheria antitoxin will produce a passive immunity to the disease for a period

*Presented before the Ramsey County Medical Society, September 29, 1919.

of two to three weeks and in epidemics the prophylactic injection of Schick positive individuals is effective in controlling the morbidity of the disease. The short period of immunity produced in this way and the possibility of producing a serum sensitivity make this procedure anything but ideal.

Active immunity has been produced in animals for many years and the repeated injection of horses with the diphtheria bacteria has been the method of producing antitoxin commercially.

In 1912 von Behring first used a mixture of diphtheria toxin and antitoxin so called "T.A." for injections in children in an effort to produce an active immunization. Progressively larger doses were given every other day until a local or general reaction was produced. The dose producing the reaction was repeated in ten days. The early reports by various German writers were rather unfavorable until it was recognized that the active immunity production was a process requiring two or three months rather than as many weeks. The one in this country to take up the problem was A. Zingher and his work with the New York Health Department has been most promising. A theoretical consideration of this method of injecting a poison and its antidote in the hope of producing more antidote is rather difficult to follow. In one specimen of toxin used by Zingher 0.0023 represented a minimal lethal dose for a guinea pig. L+ or the amount of this toxin necessary in combination with one unit of antitoxin to kill a 250 grab guinea pig in four days was 0.27 an amount over one hundred times as large. Zingher used three different mixtures of T. A. in his human inoculation. One, an overneutralized mixture represented one unit of antitoxin and 50 to 65 per cent L+; a second neutral mixture 65 to 80 per cent L+; and a third which he recommends as best suited, represented 80 to 90 per cent L+ and is slightly toxic. This slight toxicity is not alone in producing the immunity as the neutralized and overneutralized also produce antitoxin in the blood of animals and human beings. The combination of toxin and antitoxin is apparently not like a chemical reaction and in fact has been found to be a reversible reaction.

Zingher showed that by giving a single injection of a mixture of diphtheria T. A. to a horse and testing the blood daily an appreciable increase in antitoxin was discoverable on the sixth day and a maximum content was reached on the twelfth day. In the guinea pig two months were required for antitoxin production.

Under Park and Zingher's direction some 4,000 individuals have been injected with T. A. mixtures. These have been mostly children in institutions. The development of a negative Schick denoted a successful immunization. So far no case successfully immunized as shown by the Schick reaction has developed diphtheria although a considerable per cent have become carriers.

Robertson of the Chicago Health Department reports similar results. He states that "In a series of about 2,500 school children, all of whom had been exposed to diphtheria, only four developed the disease; three of these occurred within one month after the first injection, two had received only one injection, the fourth case had received the three injections and developed the disease three months later. All of these cases were very mild, made a rapid recovery and the course of the disease seemed to have been influenced by the prophylactic treatment given."

The technic followed by the New York Health Department is to inject three doses of one c.c. each of a T. A. containing 85 to 90 per cent L+ subcutaniously at weekly intervals. In Schick positive cases one injection produces some 80 per cent negative Schicks in about three months, two injections 90 per cent and three injections 97 per cent. In some cases the immunity developes quickly. In one series of 90 cases Zingher found twenty-two per cent had become immune in three weeks. In a majority of cases three to six months is required.

The Schick test has become well established as a reliable index of the existence or nonexistence of immunity to diphtheria. Numerous percentage tables of Schick reactions according to age are available and all pretty well agree with Schick's original figures. He found 7 per cent positive reactions in the new-born, 43 per cent in the first year, 63 per cent between the ages two and five and 50 per cent between five and fifteen years. Zingher's series of 497 cases showed 18.7 per cent positive for the first six

months, 52.3 for the second six months, 46 for the second year, 35 for the third and fourth years, 18 for the fifth and sixth year and 12 per cent for the seventh and eighth year.

It seems well established that most infants come into the world with an immunity to diphtheria directly inherited through the placental circulation, possibly in certain cases from the mother's milk. This immunity lasts in a majority of cases only six to nine months. Mothers with positive Schicks never according to certain statistics have children who are immune. An immune mother however may have a Schick positive child or one who is likely to become so.

The high mortality below the age of five and the existence of a high percentage of positive Schicks during these early years of life indicate that infancy is the period of life when a special effort to immunize should be made.

T. A. injections seem particularly favorable for use in the first years of life. In infancy both local and general reactions are the exception and only some ten to twenty per cent react locally and with a temperature to 100 or 103 degrees in childhood. The older the individual the greater the reaction and in adults a marked reaction, local and general may result. This is probably due to the more frequent existence in adults of a sensitivity to protein in general. While the reactions in adults may be quite severe that in children is no worse than that in small pox vaccination. Individuals showing a pseudo-Schick reaction are likely to react more markedly to the T. A. and of course having a negative Schick need not be treated.

Robertson states that no lasting ill effects have followed in any case of the 7,500 injections given by the Chicago Health Department. Some of the children had a rise in temperature and feeling of malaise for twenty-four to forty-eight hours. Out of this number of injections only forty-two children failed to attend school on Monday following the injection of the previous Friday. Those severe reactions were in children over twelve years of age.

Zingher recommends the active immunization with the full dose of 1 c.c.T.A. three times at weekly intervals of all children under 18 months of age. If these children have an immunity it will be increased and if not it will be produced. The arm or below the angle of the scapula is the choice site. After the age of 18 months he has found the Schick test in the vast majority of cases remains constant. After 18 months he recommends treating only the Schick positive cases with T. A.

The active immunity induced Zingher has shown to last three years and a few have remained immune even after four years with indications that the immunity is permanent. None have lost their immunity so far.

What is the present status of T. A. immunization? It is possible to produce an active immunity against small-pox and typhoid. Universal vaccination against small-pox is advocated by the medical profession in general. That against typhoid only when there is an increased hazard. Typhoid is not nearly as prevalent as small-pox but causes more deaths according to the United States census bureau report for 1917, viz: 10,113 deaths compared to only 204 due to small-pox. Diphtheria on the other hand is more prevalent and causes more deaths than typhoid and small-pox combined (12,453 for the registration area in 1917). The need for some preventative measure is apparent. The trial given T. A. by both the New York and Chicago Health Departments has proven its value, not in treating an epidemic but in preventing epidemics in children's institutions. The material for the Schick test and T. A. itself have just recently been put on the market in standardized form by both Parke, Davis & Co. and Lederle. The former disadvantages of instability and complex administration have been overcome. The success so far reported entitles the method to a fair trial by the medical profession particularly in institutional work. If further trial shows that a permanent immunity is established and the present findings regardings harmlessness and the high percentage of immunity production are confirmed, universal vaccination with T. A. should be adopted.

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EDITORIAL

THE FUNCTION OF MINNESOTA MEDICINE.

Minnesota Medicine is starting on its third year. Its excuse for being is mainly to make available to the profession the experience and knowledge of medical men located for the most part in Minnesota.

Being the official organ of the Minnesota State Medical Association, the Southern Minnesota Medical Association and the Sioux Valley Medical Society, all papers of interest and value to the profession which are presented before these societies and in addition any similar papers from other sources, including the various county societies, will be published in Minnesota Medicine. Obviously all papers presented cannot be published. Where duplication in regard to subject material occurs or where in the judgment of the Editing and Publishing Committee matter submitted is not of sufficient value or tends to the formation of faulty conceptions, publication is denied. If all papers submitted were published our issues would be two or three times as large as at present and the standing of our State Journal would necessarily suffer, to say nothing of a prohibitive increase in the expense of publication. While Minnesota Medicine is a paying proposition to the State Association, it could very easily become a financial burden. This added expense could be met by lowering the bars established by the American Medical Association regarding advertising. This would be a backward step and put the journal in a lower class with various other state and privately owned journals which consider the dollar more important than bona fide advertising.

In order to bring proceedings of the recent meetings of the State and Southern Minnesota Societies more promptly before our readers, the next issues will be considerably larger than usual. This will be in line with an effort to avoid allowing articles to become stale. Issues appearing during the summer months may be inversely smaller than usual.

SOCIALIZING MEDICINE

The relation of medical activities to the public is not Utopian. It is quite true that at present those who receive the best professional and hospital service are the wealthy and the paupers. The merely well-to-do, who, as a rule are discriminating in the matter of physicians patronize the best in any community. The rank and file of society which outnumber the above mentioned classes are not satisfactorily provided for.

In an effort to better this situation numerous methods have been proposed at various times and a few have been adopted. Germany was the first to establish compulsory state medical insurance. There, each employee, by the payment of a small sum each week, became entitled to a physician's services and a certain number of weeks in a hospital each year.

England a few years ago instituted a compulsory state health insurance which has proved anything but satisfactory to the public or the medical profession. Only about a third of the population was affected, hospital care was not included and medical fees were ridiculously small.

The Lancet of Oct. 11, 1919, called attention to a scheme proposed by Dr. David McKail and Mr. Wm. Jones of Glasgow and worked out most carefully for the organization of physician, clinic and hospital for the care of the sick as provided by state insurance. This scheme is based on an organization of activities made necessary and adopted during the war period in Glasgow. A population of one hundred thousand is taken as a unit and the plan is to organize a staff of fifty-three physicians, some rated as seniors receiving $4,000 to $4,500 a year, the

remaining juniors at $2,500 to $3,500. Each physician works thirty-three hours a week and the different branches of medicine and surgery in a central clinic, and outside calls are systematically provided for. This system is proposed in an effort to improve the medical situation in Glasgow.

The American medical profession would do well to study the medical situation in Great Britain and make an effort to prevent the repetition of a similar situation in our own country. If state medical insurance is to come we must be made ready with a constructive plan for handling it and protect ourselves.

The Governor of New York has announced that at the coming session of the State Legislature an effort will be made to pass a bill, backed by the New York Federation of Labor providing for compulsory state health insurance. The Medical Society of the State of New York has gone on record as unanimously opposed to any law instituting a system of compulsory health insurance.

The outcome of this clear cut fight will probably determine its future course in other states.

While such a law would not nationalize the medical profession to the extent of eliminating private medical services, it is a step in that direction and would place a large part of the medical profession in the pay of the government.

We are as a profession opposed to government ownership of doctors. It would be a calamity if an income of $4,500 were the financial goal held out to the medical man. We, as a profession, claim more than a pecuniary incentive and the Hippocratic oath still is alive. But we are human. We believe the average financial return should be commensurable with the service rendered and this surely should be large enough to induce young men of high calibre to choose medicine as a profession.

In a recent address the former president of the American Medical Association, Dr. Charles H. Mayo, expressed himself in favor of a Federal Health Department. Editorially we have pointed out the desirability of a Federal Department and Cabinet Minister at Washington which would administer such activities as the Public Health Service, the licensing of physicians, vital statistics and various medical matters vital to the nation as a whole. It would most emphatically not be our idea to have such a department take over all the medical work of the country. If that situation should arise we would feel much as a late great American expressed himself when asked by his son whether or not he should enter the army. He simply said that he had such confidence in his son's ability to make his way in the business world that he advised against it. We as physicians would with one accord advise our sons to choose some other vocation than medicine.

PHYSICAL EXERCISE

Redfield, in a recent article, argues that exercise of function, whether physical or mental causes an increase in power. In illustration he cites the hypothetical case of two young men, aged twenty, James the more intelligent and John the more muscular. James takes a position as helper in an athletic club and John enters a lawyer's office. At the end of ten years he asserts that their relations will be reversed, and James will be physically stronger and John keener intellectually. After another ten years the difference is more marked, and this law of increase in power accompanying use and degeneration following disuse will continue, he claims, up to some unknown age near the close of the individual's life.

If we admit that exercise of physical or mental functions is necessary for increase in power, the necessity for industry on the part of an individual whose vocation requires a predominance of either physical or mental activity is apparent. But more than this is necessary. A man who earns his living through the use of his brain requires a certain amount of physical exercise to keep his entire body, brain included, in trim, and the laborer needs a certain amount of mental exercise if he is to avoid becoming an entirely automatic machine. There is a point where over-use or strain occurs, which, of course, is detrimental to the organism. This point beyond which strain occurs can undoubtedly be raised by training. The straining point varies in different individuals.

Theodore Roosevelt was a good example not only of the benefit to brain from physical exercise, but of the development of both mental and bodily vigor through painstaking exercise. Starting in life with a physical equipment be-

low the average, he realized the necessity of physical robustness and acquired it through exercise consisting not simply of a few morning calisthenics, but often of several hours a day of walking, horse-back riding, boxing and the like.

In one of his letters to his oldest son, recently published, he shows that his view of the proper relation of athletics to study was quite sane. He believed that athletics, while a good servant, was an undesirable master; in other words should be used as a means and not be made the sole aim in life.

Roosevelt lived to be sixty. It is likely he would have reached three score years and ten, had he been a little less strenuous in his many activities. Whether he would have accomplished more or done more for his generation had he lived to a riper old age, is questionable.

We have all observed the effect of sudden change in habits of living as when a man gives up an occupation requiring strenuous activity and adopts a sedentary one. What changes occur in the physical make-up of the athlete leaving college or the discharged soldier returning to civil life, is difficult to determine. Often the nervous manifestations are very real and a moderate continuance of exercise is advisable.

The rapid dissolution of the elderly business man who for one reason or another is forced to give up an active career, is often noted by physicians. The explanation of this phenomenon may lie in the fact that such an individual has gone beyond the point where use develops power and has reached an age where disuse more rapidly results in degeneration.

The average Britisher takes more recreational exercise than we Americans, and has been accused of even going to an extreme in this direction. It is safe to say that the average American brain worker requires more physical exercise than he obtains in order to attain his maximum efficiency. This applies very decidedly to the medical profession.

PERSONAL RECOLLECTIONS OF THE LATE SIR WILLIAM OSLER

In the death of Sir William Osler the profession of Medicine has suffered, what will seem to the thousands who knew and loved him, an irreparable loss. Seldom can we hope to see so many admirable qualities united and basic in the character of a single individual. He was a great student, investigator and organizer, but above all this a man of high ideals and possessed to an extraordinary degree of the gift of making and holding friends. No man in the profession has done more to advance its highest aims, and the medical men of the United States especially owe to him a great debt for the impetus which he gave to the study and practice of scientific medicine and to the development of the great institutions for the teaching of modern medical science.

I first heard his name spoken by Dr. Sydney Ringer of London when engaged in post-graduate work there in 1890. He, while a student there at the University College Hospital, evidently had left in the minds of all who came in contact with him the conviction that he had a great future. Dr. Ringer said that he possessed extraordinary qualities, ideally adapted to both the practice and teaching of medicine, and that he, Ringer, was proud to have played a part, even though a small one, in his development.

My first meeting with this great man who was destined to become and remain for over twenty-five years my dear friend and benefactor, occurred in the early 90's shortly after his appointment as Professor of the Principles and Practice of Medicine at Johns Hopkins University when he gave an address to the medical students of the University of Minnesota on the occasion of the opening of old Millard Hall. His peculiar charm of manner and extraordinary power as a speaker aroused the admiration of us all and led me to accept his invitation extended at that time to visit Johns Hopkins Hospital as a special post-graduate student, there to receive the greatest clinical privileges I have ever enjoyed and to lay the foundations of an enduring friendship based, for my part, upon unbounded admiration and the warmest affection.

At this time the Medical School at Johns Hopkins Hospital had not been organized but a certain amount of formal post-graduate instruction

was being offered. This, however, was wholly disregarded by Osler in my case and I found myself enjoying all and much more than the privileges of an interne without any of the routine duties ordinarily associated with that position.

From the first day of attendance on, one was made to feel constantly the extraordinary contagiousness of the scientific enthusiasm of the Chief of the Medical Clinic and to appreciate that entire obliviousness of self-interest, extraordinary generosity, kindliness, and self-sacrificing effort which played so large a part in making the institution at that time a students' heaven. The atmosphere was one of wholehearted co-operation, scientific endeavor, unselfishness, and kindly effectiveness and was reflected in the attitude of every one connected with the Institution.

To an extraordinary degree the spirit of research permeating the Medical Clinic was combined with the utmost regard for the interests of the patient. All newly announced methods of respectable antecedents and endowed with any reasonable amount of promise of performance might obtain a trial but these had to undergo a critical sifting and could endure only when sound in substance and useful to the patient.

The clinics in Medicine held by the Chief were remarkable, as also were the bedside visits in hospital rounds, and both served to demonstrate the extraordinary erudition, quick perception, thoroughness, practical grasp, keen sense of humor, and abounding kindness of this great teacher and clinician.

One could not long remain in contact with Sir William Osler without realizing that his capacity for making and keeping friends and for inspiring deep affection in those at all intimately associated with him—whether as students or colleagues—arose not only from admiration for his qualities as a medical man and teacher but to an even greater degree from the extraordinary unselfishness and helpfulness of the man.

For years following my course of instruction at Johns Hopkins I made an annual pilgrimage to the Institution in order that I might make rounds at least once with the Chief, and I remember that on one occasion when prevented from staying over as planned until the Monday on which rounds should have been made he insisted upon making an extraordinary tour of the hospital on Sunday morning in the face of what was known for many years in the East as "the great blizzard" rather than to have this annual custom violated.

It is no wonder that practically every honor which the Medical Profession could give was bestowed upon Sir William Osler*. His greatest achievement no doubt is to be found in the part he played in the organization of Johns Hopkins Hospital. It is impossible to measure the enormous influence for good or the stimulus which he imparted as teacher and associate.

When finally in 1905 he was made Regius Professor of Medicine by Oxford University, the bestowal of this highest honor in the gift of his Mother Country served to crown his remarkable achievements. It also served to fulfill the prediction made by a leading Canadian surgeon, who, on the occasion of the banquet of the British Medical Association in Montreal, at the first meeting held on this side of the water, warned those of us who were present from "the States" that we could not hope to hold Osler no matter how much we loved him for "he was only passing through the United States in bond."

To many of us who loved the man it seemed incredible that he should leave Johns Hopkins and equally so that he would find the environment of his new position suited to his temperament and needs. His departure was the occasion for a great banquet held in New York, given and attended by medical men from every part of the country who gathered to express their admiration and their regret.

As one of these I no doubt was unduly solicitous with respect to the wisdom of the change which he was making and on this occasion he told me that when I visited him at Oxford I would be convinced that he was right and I was

*1874. Professor of Physiology & Pathology at McGill University.
1884. Prof. of Clinical Medicine University of Pennsylvania.
1889. Prof. of Principles & Practice of Medicine, Johns Hopkins University and Chief Physician to Johns Hopkins Hospital.
1895. Served as President of the Association of American Physicians.
1905. Appointed Regius Professor of Medicine at Oxford University and Thomas Young Lecturer in Medicine at St. George's Hospital, London.
Hon. D. Sc. Oxford, Cambridge, Dublin, Liverpool, and Leeds.
LL.D. McGill, Toronto, Aberdeen, Edinburgh, Yale, Harvard and Johns Hopkins.
D.C.L. Durham and Trinity University.
Hon. M.D. Christiania.
Hon. F.R.C.P. Dublin.
Foreign Associate of Academy of Medicine, Paris.

wrong. When a short time thereafter this happy event took place, I found myself installed, not in his home, but in his rooms at Christ's Church College, Oxford, where I was made to lead the delightful life of the College for several days with the result that I came to realize very quickly that he had done the correct thing and had found exactly the atmosphere and the field best suited to his needs and requirements at that stage of his career. He felt that the more strenuous and active period of his life had passed, sought and found a satisfying amount of teaching opportunity, did a limited amount of consultation practice and, enjoying daily a stimulating companionship and a beautiful and historic environment, he found time, material and opportunity for writing, researches into medical history and the full enjoyment of life and living.

One of my most valued recollections of Sir William Osler pictures him as he delivered the Harveian Oration at the meeting of the Harveian Society in London when President of that ancient and distinguished body of famous medical men. He was at his best on this occasion and his address was both scholarly and felicitous, holding the attention of his auditors from the first word until its close.

During all these years our correspondence had never been interrupted until the outbreak of the Great War when he was called upon to play a large part in the organization of the British Medical Service. Even then an occasional note arrived and only after the death of his only son who was killed in Flanders did these fail to show something of the rare humor of the man.

But a few weeks ago he sent a brave message to his friends on this side of the water from what was to prove his death-bed, and it was evident that neither grief nor bodily suffering could quench his indomitable spirit.

On the occasion of his departure from the United States he said in the course of his address at the great banquet hitherto referred to that he did not feel that he had accomplished much or that he was in any way worthy of the loving regard in which he nevertheless was glad to find himself held by his fellow-men, but that he could at least say that through his medical life he had tried to do his best every day.

No better tribute can be paid to him than to say in closing that, however great his scientific achievements and however numerous the concrete examples of these, they are in the minds of those who knew him best quite lost in the beauty of his character and in the inspiration which he brought to the thousands of men, young and old, who had the rare privilege of his friendship.

CHAS. LYMAN GREENE,

CLINICS FOR PHYSICIANS OF STATE AT THE UNIVERSITY HOSPITAL DURING AUTO SHOW WEEK

Clinics, demonstrations and lectures will be given at the University hospital and laboratories of the Medical School at the University for alumni and other physicians of the State all day Thursday and Friday Feb. 5 and 6, 1920 of Automobile show week. This custom was established three years ago but on account of the war was omitted last year.

UNIVERSITY OF MINNESOTA
Program for Physicians' Days
Thursday, February 5th

8:30-10:45—Operative Clinic.....
Drs. A. MacLaren and A. C. Strachauer
(large operating room, University Hosp.)
Operative Clinic, Ophthalmology.....
.....Dr. W. R. Murray
(small operating room, Univ. Hospital)
Cystoscopic demonstrations, including pyelography and allied procedures.....Dr. F. A. Olson
(dressing room, first floor, Univ. Hospital)
10:45-12:15—Gynecological Clinic .....
Drs. J. C. Litzenberg and W. H. Condit
(large operating room, Univ. Hospital)
Urology .....Dr. F. R. Wright
(small operating room, Univ. Hospital)
9:00-12:00—Demonstrations in Surgical Laboratories .....Dr. J. F. Corbett
Surgery of the peripheral nervous system, nerve suture, intestinal suture, etc.
10:30-12:00—General Surgery ....Dr. J. A. Johnson
(University Dispensary)
Obstetrics .....Dr. R. T. LaVake
(University Dispensary)
11:00-12:00—Pediatric Clinic .....
.....Drs. F. W. Schlutz and Max Seham
Luncheon, Minnesota Union.
1:00- 2:00—Staff Rounds, University Hospital
..... Medical Staff
1:00- 2:00—Medical Dispensary
General Medicine .....Dr. J. P. Schneider
Gastro-intestinal .....Dr. C. B. Wright
Heart .....Dr. Olga Hansen
Nervous & Mental .....Dr. Angus Morrison
1:00- 2:00—Skin Clinic, Dispensary.....
.....Dr. H. G. Irvine, Dr. G. M. Olson.
2:00- 3:00—Medical Clinic.....Dr. L. G. Rowntree
(Lecture room, Uni. Hospital)
Pediatric Clinic .....Dr. F. C. Rodda
(Operating room, Univ. Hospital)
3:00- 4:00—Ward Rounds. University Hospital
Nervous & Mental .....Dr. A. S. Hamilton
Pediatrics .....Dr. Rood Taylor
Medicine .....Dr. R. I. Rizer

4:00- 5:00—Demonstrations in Medical Laboratories
.....Medical House Officers
(University Hospital)
Grouping of blood.
Alveolar CO2 and phthalein test.
Benedict for sugar.
Basal metabolism.
8:00 p.m.—University Medical Society, Institute of Anatomy.
Influence of Atmospheric Humidity....
.....Dr. E. P. Lyon
Gastric Capacity of Children.....
.....Dr. R. E. Scammon
Local Anaesthetics.....Dr. A. D. Hirschfelder
Demonstration of Interesting Specimens
.....Dept. of Pathology
9:30 p.m.—Laboratory demonstrations.
Anatomy, Physiology, Pathology, Pharmacology.
Friday, February 6th.
8:30-10:45 a.m.—Operative Clinic.....
.....Dr. A. A. Law and Dr. H. P. Ritchie.
9:00-10:00—Ward Rounds, University Hospital
..... Surgical Staff
8:30-10:45—Rhinology, Operative Clinic...
.....Dr. H. S. Clarke
(small operating room, Univ. Hospital)
10:30-12:00—General Surgery, University Dispensary
.....Dr. E. C. Robitshek
10:45-12:30—Gynecological Clinic.Dr. J. L. Rothrock
(large operating room, Univ. Hospital)
Obstetric demonstration....Dr. J. C. Litzenberg
(small operating room or ward, Univ. Hospital)
Luncheon, Minnesota Union.
1:00-2:30—Medical Dispensary.
General Medicine.....Dr. C. R. Drake
Gastro-intestinal .....Dr. F. H. K. Schaaf
Tuberculosis .....Dr. F. W. Wittich
1:30-2:30—Skin Clinic, Dispensary.....
.....Dr. S. E. Sweitzer, Dr. J. Butler
1:00-2:30—Urology, cystoscopic demonstrations
.....Dr. G. J. Thomas
(University dispensary)
2:00-3:00—Medical Clinic, University Hospital.
Medicine, (Lecture room).....Dr. S. M. White
Nervous & Mental (Operating room)....
.....Dr. A. S. Hamilton
3:00-4:30—Ward Rounds, University Hospital
Medicine .....Dr. C. E. Nixon,
....Dr. E. T. F. Richards, Dr. A. H. Beard
Pediatric .....Dr. N. O. Pearce
4:30—Clinical Pathological Conference, Institute of Anatomy
Clinicians ...Dr. H. E. Robertson, Dr. E. T. Bell

The University of Minnesota Medical School is anxious for the physicians of the state to realize that the faculty of the Medical School is desirous to serve the needs of the profession of the state as well as those of under-graduate students. These Physicians' Days are arranged in order to make it possible for the physicians of the state to keep in touch with the work of the University. All physicians will be made welcome.

CORRESPONDENCE

Minneapolis, Minn, January 12, 1920.

Minnesota Medicine:

All discharged soldiers, sailors and marines who received injuries or contracted illness or disease in line of duty, and who are now suffering the after effects, are entitled to free medical attention and hospital or sanitorium care from the Government.

The United States Public Health Service—Dr. H. M. Bracken in charge, 744 Lowry Building, St. Paul—is responsible for this care in Minnesota, North and South Dakota and Montana. Contracts have been made with suitable hospitals and sanitoria and a large staff of physicians and experts has been appointed.

We find that many discharged soldiers are suffering for medical care because of lack of funds, and others are paying for such care at serious personal inconvenience, and we are most anxious to have it generally understood that this is unnecessary, and that ample facilities are at their command free of charge.

While the Government is willing to provide for every discharged man in this way, it is not willing to be held liable for unauthorized treatment by private physicians or care in a private hospital.

It would be a great service to the discharged soldiers if every physician could understand this situation, in order that he might report any case of a discharged soldier, sailor, or marine that comes to his attention where there is the slightest chance that the disability is traceable to army service.

It is especially important, where hospital care is necessary, that the men should be officially examined and entered in hospitals authorized by the Government.

Red Cross Home Service Sections (401 LaSalle Building, Minneapolis—and Corner 4th and Market Streets, St. Paul) understand exactly what steps must be taken to facilitate the man's examination by the Public Health Service staff, and it will undoubtedly expedite matters if the discharged men will report themselves to Red Cross Home Service, or if interested physicians will refer all cases that come to their attention to the Home Service Sections.

In a locality where there is no Red Cross Home Service Section, a discharged man should write himself, or, better yet, ask a physician to write, to the Public Health Service, stating his case and asking for instructions.

Any effort you can make to secure publicity to these facts will be greatly appreciated.

Very sincerely yours,

Ralph A. Marsh,
Secretary,
Department of Discharged Men.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA ACADEMY OF MEDICINE DECEMBER MEETING, 1919

The regular monthly meeting was held on the 10th, Dr. Dennis, the vice president, taking the chair in the absence of Dr. Sweetser. The minutes of the previous meeting were read and approved. There being no special business to come before the society, the entire evening was devoted to hearing case reports and listening to the reading of papers. Dr. Leavitt reported a case of hydatidiform mole, and Dr. Burch a case of hypophyseal tumor. The two papers were presented by Drs. Hamilton and Corbett, one dealing with nerve injuries and the other with nerve surgery. Not often does the secretary permit himself to comment on what is offered before the Academy; but in this instance he is only repeating what many others were heard to say—that the subject was discussed in a masterly way.

Twenty-two members and two visitors were in attendance.

TUMOR OF THE HYPOPHYSIS CEREBRI

Dr. Burch reported a case of hypophyseal tumor in a woman twenty-five years of age. For thirteen years she had complained of poor vision, but otherwise her health was good. She never had had any serious illness. An occasional attack of vertigo was the only thing she spoke of as disturbing, except that she could not see well. She had never menstruated, but no illfeeling was charged to this.

At twelve years of age her eyes were so bad that she had to stop school, and it was only after prolonged treatment with glasses and a collyrium that she was able to resume her studies. An examination showed a concomitant divergent strabismus of the right eye. The external ocular structures and pupillary reaction were normal and the media clear. Both optic nerves showed advanced atrophy. No retinal disturbances. There was a bitemporal hemianopsia, the field defect being more typical in the left eye; the contraction, however, was more marked in the right. In view of the history, the impaired vision, the optic atrophy, and the hemianopsia, a tentative diagnosis of a tumor of the hypophysis was made. The X-ray showed the nasal sinuses present and clear, the sella turcica much enlarged, the floor thick and depressed.

Anterior lobe extract in three-grain doses t.i.d. was tried. At the end of a month the patient had gained a few pounds in weight, but otherwise showed no improvement.

On November 25, a right middle turbinectomy was performed, followed by sphenoidal puncture. The sinus proved to be of normal dimensions, except transversely; there was no fluid present, nor could any tumor mass be palpated. A radiograph picture, taken with a probe in position, showed the end of the probe touching the thickened floor of the sella.

CASE OF HYDATIDIFORM MOLE

Dr. Leavitt reported a case of hydatidiform mole in a young woman pregnant for the first time. The patient was married in May. In June, July and August she menstruated naturally, but missed the September period. In October she had a flowing spell that was thought to be a return of the menses, and for a short time gave up the thought that she was pregnant. The flow continuing at irregular intervals thereafter for a number of weeks, her physician was consulted. In November, in addition to her gastric disturbances, which were unusually troublesome, she began to complain of pain in the uterus. Both complaints grew progressively worse as the days went by.

When seen by Dr. Leavitt for the first time, her physician, Dr. John Kelly, stated that her anemia, which was quite apparent, was of long standing. The uterus was as large as a six-months gestation, and very sensitive to touch. There was no bleeding at the time, but there had been considerable that day. No fetal movement had been felt at any time. On the day following, the pains continued with increasing vigor. A miscarriage seemed imminent. She was taken to the hospital. An attempt to dilate the cervix failed. The tissues were as unyielding as in the non-pregnant state. To add to our perplexity, a good-sized sound could be passed more than eight inches into the cavity of the uterus without meeting resistance or bringing away blood or water. During the few days that followed, the pulse ran as high as 128, the temperature occasionally rising two or three degrees. Opiates were required to relieve pain. Nausea and vomiting were almost constant. The anemia became rapidly worse. She could not sleep. Four days later several blood clots were passed, and in the night following she had what several physicians who saw her believed to have been an intraabdominal hemorrhage. The abdomen was opened the following morning, thinking to find a ruptured ecotopic pregnancy. Instead, both tubes and both ovaries were normal. An incision was made in the uterus, through which poured cysts of various sizes, varying from that of a pinhead to a pea. How much in quantity came away or was removed from the cavity of the uterus could not be said exactly; it was estimated to be fully two double handfuls. The endometrium was carefully sponged and the surface inspected. The uterus was closed with both interrupted and continous sutures. During and following operation various measures were employed to combat the anemia, and as far as the pulse was concerned, the patient left the operating room better than when she entered. However, she never rallied, and died four hours later. Specimen shown.

F. E. Leavitt, Secretary.

OF GENERAL INTEREST

Dr. P. S. Epperson of Duluth has moved to Chicago.

Dr. E. S. O'Hara, recently of Milroy, has located at Grygla.

Dr. Henry W. Goehrs formerly of Melrose has located at St. Cloud.

Dr. Cora Allen of Heron Lake has accepted a hospital position in Iowa.

The new hospital at Milaca is now opened and ready to receive patients.

Dr. A. W. Swedenburg was appointed Government Examiner for Pennington County.

Dr. A. B. Kirk of Chisholm will move to California where he will make his future home.

Dr. Paul F. Brown, who served in France has returned to his practice in Minneapolis.

Dr. G. A. Larson has associated himself with Drs. F. M. and J. F. Smersh of Owatonna.

Dr. C. A. Fjeldstad, formerly of Red Wing has opened offices at 712 Pillsbury Bldg., Minneapolis.

Dr. H. W. Arndt of Paynesville has moved to Frazee, where he purchased the hospital building.

Dr. G. I. Badeux of Ironton has moved to Brainerd where he will enter partnership with Dr. Thabes.

Dr. L. M. Keene of Alexandria, was married in Minneapolis, December 12th to Mrs. M. M. Soper.

Dr. G. T. Nordin has returned from France and opened offices at 743 East Lake Street, Minneapolis.

Dr. J. M. Neal head intern at the City Hospital in Minneapolis was appointed temporary superintendent.

Drs. Olson and Derdiger, who have been practicing medicine in North Dakota have located at Battle Lake.

Dr. F. N. Bjerken recently returned from overseas, has entered into partnership with Dr. P. Cremer of Hastings.

Dr. E. T. W. Boquist recently returned from overseas, has opened an office in the Martinsen block, Minneapolis.

Announcements have been sent out of the marriage of Dr. O. H. Warner of Canby to Miss Ursula Troendle of Mapleton.

Dr. S. D. Gausemel, who has been practicing at Kenyon has moved to Goodhue and formed a partnership with Dr. H. P. Sawyer.

Dr. I. J. Murphy has moved from the Donaldson Bldg., to the Pillsbury Bldg., Minneapolis, where he has opened a consultative laboratory.

Dr. G. A. Holm has returned from overseas and has located in Minneapolis. He was formerly in partnership with Dr. Tuohy of Duluth.

Dr. R. G. Spurbeck has returned to Cloquet after a five months absence. Dr. Spurbeck was taking a special course in eye, ear, nose and throat diseases.

Dr. John Perkins has moved from Redwood Falls to Sanborn, where he has taken over the practice of Dr. M. C. Piper. Dr. Piper has moved to Rochester.

Doctors of Bayfield, Iron and Ashland counties have elected the following officers: President, Dr. J. M. Dodd, Ashland; Vice-president, Dr. H. Hannum, Bayfield; Secretary-Treasurer, Dr. Bell, Andrus.

Dr. Henry A. Beaudoux announces that he has returned to civil practice and will open offices at 605 La Salle Bldg., Minneapolis. He will limit his practice to eye, ear, nose and throat work. Dr. Beaudoux formerly practiced in St. Paul.

The plan to close the hospital at Carlton known as the Red Cross Hospital and which was established by the Minnesota Forest Fires Relief commission, has been reconsidered and it will be continued in operation with Drs. Raiter and Stuart in charge.

This picture will be shown in regular theatres throughout the country, wherever it receives the local support of the authorities. It is considered the best propaganda film on public health subjects, ever made, and it should be shown in every municipality of the United States.

The Western Surgical Society met at Kansas City in December and elected the following officers: Dr. Arthur T. Mann of Minneapolis was elected President and Dr. Warren A. Dennis of St. Paul was elected Secretary. The 1920 meeting of the society will be held in Los Angeles.

A meeting of the staff of the Mayo Clinic was called December 31st in memory of the late Sir William Osler. Several physicians including Drs. W. J. and C. H. Mayo discussed phases of Dr. Osler's life and work and reviewed his remarkable influence on the development of modern medicine.

In line with the intensive warfare being carried on by the State Board of Health venereal clinics have been operating for some time, one for men at the University; one for men and women at the St. Paul Dispensary; one for women at the Minneapolis City Hospital and one for men and women at St. Mary's Hospital.

The last state legislature passed a bill providing for the establishment of classes for the conservation of vision by appropriating a sum of $200 per annum for each child requiring the special benefit of such classes. Mr. Meyer of Ohio has been appointed supervisor of this department and Dr. Douglas F. Wood, Minneapolis has donated his services as ophthalmologist for examinations of candidates.

At the meeting of the Southern Minnesota Medical Association held in December at Mankato, the following officers were elected: President, Dr. H. Z. Griffin, Rochester; Vice-President, Dr. Archa Wilcox, Minneapolis; Second Vice-President, Dr. W. J. Richardson, Fairmont; Secretary, Dr. H. T. McGuigan and Treasurer, Dr. G. F. Merritt, St. Peter. Fairmont, Minnesota was selected as the next convention city.

The new motion picture, "SOME WILD OATS," on the venereal disease question, has been released. It was made under the auspices of the N. Y. C. Health Dept., and with the aid of the U. S. Navy, Recruiting Division. It is in seven reels, one of which contains propaganda, and the other six, a powerful love story, showing the ravages of the disease, how it is contracted, and the solution of stamping out same in any locality.

In one of the reels, Royal S. Copeland, Health Commissioner of New York City, is shown at work, and it also shows what his department is doing to eradicate this menace in New York City. All the authorities say that "SOME WILD OATS" is a clean production, as it is so constructed that it does not offend anyone, but teaches a remarkable lesson—without preaching. It is the most recent of V. D. Features produced, being made by the health officials who condemned, "FIT TO WIN," "THE END OF THE ROAD, and "OPEN YOUR EYES," which they considered immoral and prohibited their showing in the State of New York.

NEW AND NON-OFFICIAL REMEDIES

During December the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion with New and Nonofficial Remedies:

Calco Chemical Company:
Procaine-Calco.

Merck and Company:
Ichthyol-Merck.

E. R. Squibb and Sons:
Thyroxin-Squibb.
Typhoid Parathyphoid Bacterin (Special Bacterial Vaccine No. 13) Squibb.

Winthrop Chemical Company, Inc.:
Sajodin.

Hoyt's Gluten Special Flour.—A gluten flour containing protein, 80 per cent; fat, 1 per cent and starch, less than 10 per cent. This flour may be used when a diet relatively free from carbohydrates is desired, especially in diabetes. It does not make a satisfactory bread, but may be used to prepare muffins, flat cakes, or gruel. The Pure Gluten Food Co., Columbus, Ohio (Jour. A. M. A., Dec. 13, 1919, p. 1843).

Lactic Acid-Producing Organisms and Preparations.—Fermented milks have long been used because they were palatable to many or because of an opinion among the laity and among physicians that they were advantageous in certain disorders of the gastro intestinal tract. A great stimulus to the employment of fermented milk was given by the theories of Metchnikoff regarding intestinal putrefaction, which are, however, entirely unsupported by scientific evidence. No one seriously subscribes to his opinions at the present time, but, on the other hand, there is evidence that the administration of sour milk products is at times beneficial. In pediatrics, fermented milk has found a wide application. By the use of acid-producing bacteria, milks of suitable composition may readily be prepared. For this purpose, bacteria of the Bulgarian bacillus group, usually in assocation with **Streptococcus lacticus,** have been found particularly satisfactory. There is little evidence showing that organisms of the Bulgaricus group can be implanted in the intestinal tract. There is little evidence that liquid cultures of lactic acid organisms are of value as local application to mucous membranes or in arresting putrefaction or suppuration in wounds, abscesses or sinuses. Liquid cultures of lactic acid organisms, and still more the tablets, deteriorate with age. All such preparations must be stored in an ice chest and should be marked with an expiration date after which they are not to be used (Jour. A. M. A., Dec. 20, 1919, p. 1887).

Lactic Acid Ferments.—In preparing the 1920 edition of New and Nonofficial Remedies, it appeared desirable to the Council on Pharmacy and Chemistry that careful reconsideration should be made of the use in medicine of lactic acid bacteria—and products prepared by means of these bacteria—in relation to practical therapy. A special committee consisting of a physiologic chemist (Lafayette B. Mendel, chairman), a pediatrician (John Howland), an internist (W. P. Longscope), a rhinologist (H. I. Lilly), and a bacteriologist (L. F. Rettger) took up the problem. A circular letter was sent by the committee to a large number of well-known bacteriologists, clinicians and manufacturers who might be assumed to have experience or information bearing on the practical use of lactic acid bacilli. Based on the replies which were received, the committee has revised the discussion of "Lactic Acid-Producing Organisms and Preparations" which appears in New and Nonofficial Remedies. There replies showed that the bacteriologists and scientific laboratory workers show far less enthusiasm for the claims of lactic acid bacteria for a place in practical therapy than do the clinicians. It was the general opinion that the Bulgarian bacilli cannot be effectively implanted in the alimentary canal by feeding cultures thereof. The overwhelming preponderence was against the usefulness of cultures of the bacilli in infected sinuses, cavities, etc. The committee recommended that cultures of **Baccilus acidophylous** be not included in N. N. R. at present. The committee considers it important that the Council should continue its control of the viability and purity of cultures offered for sale (Jour. A. M. A., Dec. 20, 1919, p. 1895).

Benzyl Benzoate for Therapeutic Use—Van Dyk and Co.— A brand of benzyl benzoate which complies with the N. N. R. standards. For a discussion of the actions, uses and dosage, see New and Nonofficial Remedies, 1919, p. 53. Van Dyk and Co., New York.

Luminal. —Phenobarbital—Phenyl-Ethyl-Barbituric

Acid — Phenyl-Ethyl, Malonyl-Urea. Phenobarbital (luminal) differs from barbital (veronal) in that one ethyl group has been replaced by one phenyl group. It is claimed that the introduction of the phenyl group increases the hypnotic power of luminal over that of barbital. Luminal is claimed to be a useful hypnotic in nervous insomnia and conditions of excitement of the nervous system. Dose, from 0.2 to 0.3 gm., increased if necessary to 0.8 gm. Luminal is supplied in powder and as Luminal Tablets 1½ luminal. Winthrop Chemical Co., Inc., New York.

Luminal-Sodium.—Phenobarbital Sodium—Sodium Phenyl-Ethyl Barbiturate. The monosodium salt of phenyl-ethyl-barbituric acid. The actions and uses of luminal-sodium are the same as those of luminal. For hypodermic injection luminal-sodium is used in the form of a 20 per cent solution. The dose of luminal-sodium is 10 per cent greater than that of luminal. Winthrop Chemical So., Inc., New York.

Sajodin.—Calcium monoiodobehenate. The calcium salt of monoiodobehenic acid. Sajodin is used as a substitute for iodides. The iodin of sajodin, being longer retained, is perhaps better utilized. It is also less liable to produce gastric disturbance than alkali iodides. Sajodin is also supplied as Sapodin Tablets 8 grains. Winthrop Chemical Co., Inc., New York (Jour. A. M. A., Dec. 27, 1919, p. 1939).

PROPAGANDA FOR REFORM

The New Bacchus.—No longer should artists—at least, American artists—represent Bacchus astride a wine barrel: the little god should be depicted astraddle a "patent medicine" bottle. As every physician and pharmacist knows, there are on the American market a number of widely advertised and extensively sold "patent medicines" whose most potent ingredient is alcohol. The problem of controlling these alcoholic "patent medicines" can be satisfactorily solved in only one way, and that way is to prohibit the use of alcohol in preparations of the "home remedy" type, that is, in those products which are sold indiscriminately to the public for the self-treatment of disease (Jour. A. M. A., Dec. 6, 1919, p. 1772).

Antimeristem-Schmidt.—A letter received by physicians from the "Bakteriologisch-Chemisches Laboratorium Wolfgang Schmidt" of Cologne, Germany, calls the attention of American physicians to Antimeristem-Schmidt. Ant'meristem-Schmidt was rather widely exploited some six or seven years ago. It is a preparation claimed to be useful in the treatment of inoperable cancer and as a supplementary treatment after operation for cancer. The treatment has been found without effect and no license for the sale of Antimeristem-Schmidt has been granted by the U. S. Treasury Department and therefore its importation into this country is prohibited (Jour. A. M. A., Dec. 6, 1919, p. 1787).

Thialion.—This is an heirloom of the days when lithium salts were supposed to be nature's antidote for all kinds of ailments supposedly due to excess of uric acid. The Council on Pharmacy and Chemistry reported in 1906 that it was not a definite chemical compound as suggested by the chemical formula published by the proprietor, the Vass Chemical Company, but a mixture consisting chiefly of sodium sulphate, sodium citrate and small amounts of lithia. In recent advertisements, Thialion is referred to as "A Non-Effervescing Lithiated Laxative Salt," "a non-hygroscopic, non-deliquescent, granular salt of lithia," etc., but the chemical formula does not appear, nor is any definite statement of composition furnished (Jour. A. M. A., Dec. 6, 1919, p. 1789).

Lubricating Jelly.—The subjoined formula for an inexpensive lubricating jelly has been used in the German Hospital (now the Lankenau Hospital), Philadelphia, for a number of years: Tragacanth, whole, 3 gm.; glycerin, 25 cc.; phenol, 1.5 gm.; distilled water to make 300 cc. The tragacanth is broken in small pieces and put into a wide-mouthed bottle; the other ingredients are added and the bottle is frequently shaken (Jour A. M. A., Dec. 13, 1919, p. 1852).

The Prevention of Simple Goiter.—O. P. Kimball, J. M. Rogoff and D. Marine publish their third paper on the effect of sodium iodid in the prevention of goiter in school children. They conclude that simple goiter in man may be prevented and that the method may be carried out as a public health measure. Two gm. of sodium iodid given twice yearly seems adequate for the purpose (Jour. A. M. A., Dec. 20, 1910, p. 1873).

PROGRESS IN MEDICINE AND SURGERY

OPEN AMPUTATION THROUGH THE KNEE-JOINT: Morris K. Smith, M. D., of New York, (Annals of Surgery, Vol. LXX. No. 3, September, 1919) says, "Open amputation through the knee-joint for suppurative arthritis of the knee was first done at American Red Cross Military Hospital, No. 2, at the suggestion of Colonel Joseph A. Blake. The patient had a badly infected joint with extensive burrowing of pus up the thigh. It was Colonel Blake's idea to avoid opening bone and marrow cavity to the infection."

He states, "We have done this operation in six cases, of which three were for suppurative arthritis, and three for gangrene of the leg. Its advantages over open amputation through the lower end of the thigh fall under three heads: (1) less opportunity for bone and marrow cavity infection; (2) improvement in the ultimate stump; (3) lessened operative shock."

The writer feels this method is worth reporting as the recent war literature has given it but passing mention. Its prime worth would be where menial operative shock is necessary.

GEORGE EARL.

TRAFFIC IN NARCOTIC DRUGS. Report of Special Committee of Investigation Appointed March 25, 1918, by the Secretary of the Treasury. Published from the office of the Commissioner of Internal Revenue, June, 1919.

Statistics compiled by the Department of Commerce show that the quantities of narcotic drugs imported in this country have steadily increased from the date when the first entries were reported until our supplies were shut off as a result of the present war. In 1915 approximately 490,000 pounds of opium and more than 1,000,000 pounds of coca leaves were supplied to the public through a total of 233,491 individuals. The minimum value of these drugs computed on the basis of retail price of crude material would be something over $20,000,000. Investigators believe that only from 10 per cent to 25 per cent of this quantity is actually needed to supply the demand for legitimate medical purposes.

The number of individuals addicted to the use of opium and its derivatives, coca leaves and their derivatives, in the United States varies in estimation from 200,000 to 4,000,000. There is a laxity of laws and regulations making it compulsory for the registration of addicts throughout the country and this results in impossibility to obtain accurately the number of addicts in the United States at the present time. It is believed from questionnaires that physicians of the country have 237,000 addicts under treatment at the present time. Addicts of the underworld are difficult to estimate. Accurate data was secured by the health officer of Jacksonville, Florida, to the effect that 1.31 per cent of the population of that place were addicts. On this basis there would be 1,388,600 addicts in the United States. The health officer of New York reports 103,000 addicts in that city alone which is equivalent to 1.8 per cent of the population. On this basis there would be 1,908,00 addicts in the United States. It is probable that the total number of addicts exceeds 1,000,000. Reports of decreases in the number of addicts are received from rural districts and smaller cities where little or no attention has been given this subject before. The consensus of opinion is that the number of addicts will increase as the prohibition laws are enforced.

Anyone repeatedly taking a narcotic drug over a period of thirty days is in great danger of becoming an addict. When addiction has been established it is impossible to discontinue the use of the drug without outside assistance. The habit of using opiates or cocaine is acquired through association with addicts, through the physician and through self-medication with these drugs in their original form or in patent or proprietary preparations containing the same.

The first two are of about equal importance, the last being less so.

There are two classes of addicts, those of the underworld and those of good standing. The first mentioned class acquires the habit through association. The second usually through physicians, although some through self-medication.

Morphine, heroin, opium and cocaine are the drugs used by addicts in order of their frequency. The use of heroin is increasing, it can be taken easily, the habit is acquired by association in a large majority of cases. The drug is regarded the most dangerous from the standpoint of habit formation.

Statistics on ages and employment of addicts show that most heroin and cccaine addicts are young, usually under the age of twenty. A large proportion of the addicts are not engaged in occupations which call for hard labor. Many do not work at all. This is especially true of heroin habitues. Habit-forming drugs produce a marked physical and mental deterioration in individuals addicted to their use and such an addict seldom reaches old age, falling an easy prey to some other ailment.

As a usual thing an addict appears normal to the casual observer but is weak in character and will and lacking in moral sense. The drug habit has some bearing on the question of crime but it is not yet clear to what an extent. Where addicts have committed violent crimes it is reported that they were users of cocaine or heroin.

The economic loss to the country sustained through drug addictions may be gained from the cost of the drugs used by addicts and the loss through employment of those addicted. It is believed that satisfaction of addiction costs the addicts $61,000,000 a year. On the basis of 250,000 unemployed addicts the conservative estimate of the loss in wages would be $150,000,000. These figures do not include the cost of drug addiction to individual as a result of loss through theft and burglary nor the cost to the state and municipalities in the suppression and punishment of crime and the care and treatment of those who eventually become a charge on the community.

Conclusions

1. Records having a bearing on phases of drug addiction are meager, if kept at all. This is due principally to lack of knowledge of the seriousness of the situation. These conditions should be remedied.

2. No further National legislation is necessary on the subject at the present time.

3. The question of the responsibility for the care and treatment of addicts should be discussed and settled as soon as possible.

4. Educational campaigns should be instituted in all parts of the United States to inform the people and the medical profession of the seriousness of drug addiction and secure their aid and cooperation in its suppression.

5. The treatment of drug addiction should be thoroughly studied and standardized.

6. The medical need for heroin is negligible compared with the evil effects of its use. Manufacture, sale, distribution or administration of this drug should be prohibited by states and municipalities.

C. E. Smith.

STUDIES IN PROTEIN INTOXICATION: T. Harris Boughton (Jour. Immunology, July, 1919,) reports on the histological findings in the organs of rabbits given repeated anaphylactic shocks by repeated injections of a foreign protein, i. e., egg white.

The animals had been previously sensitized by three doses of egg white—one subcutaneous, one intraperitoneal and one intravenous.

The toxic doses were given at varying intervals, the total time running from seven to thirteen months.

The animals dying in acute anaphylaxis were posted at once; the rest were killed with chloroform or ether and posted.

The most stricking changes were found in the kidneys—the characteristic lesion being located in the epithelium of the convoluted tubule and in the ascending limb of Henle's loop. Apparently this lesion begins with edema of the epithelial cells followed by vacuolization. The vacuoles increase in size until the cells present the appearance of an irregular network and the free margin becomes frayed. Necrosis or regeneration follows.

This change is most marked in animals dying in acute naphylaxis. Out of 20 cases suitable for autopsy all but 2 showed this lesion.

In addition to these epithelial changes, fibrous infiltration was quite marked as well and while the areas where small and widely disseminated, they were numerous.

Less constant changes were dilatation of tubules, edema of the glomeruli with proliferation of the endothelium, and slight vascular changes, i. e., edema and thickening of the walls of the small arteries.

Connective tissue changes were seen in the heart and liver and vascular changes in the lungs and liver.

The interest of this article to the reviewer lies in the application of the theory of protein intoxication as an etiological factor in nephritis.

The microscopic findings in both nephritis and experimental chronic protein intoxication are very similar—namely, epithelial-vascular-interstitial.

While considerable experimental work on nephritis has been done with such chemical irritants as uranium nitrate, but little investigation has been carried out when foreign protein was the exciting cause.

Previous work with proteins has been done by the author and others on guinea pigs with findings similar to those reported in rabbits.

So it is not too great a stretch of the imagination to seek for etiology of Bright's disease along this line.

CHAS. N. HENSEL.

NEUROLOGICAL INDICATION FOR AND AGAINST OPERATION IN TRAUMATIC INJURIES AFFECTING THE CENTRAL NERVOUS SYSTEM. John Jenks Thomas; Boston Med. and Surg. Jour., Vol. 160 XVII, No. 15.

The author endeavors to give his conclusions after a study of a considerable number of cases of this character. He states spinal column injuries present fewer debatable points than injury to the brain. The cord is damaged when the trauma is applied to the column and in addition we may have injuries of the cauda or nerve roots.

Falls where force is applied to the axis of the column may produce compression fracture of the body of the vertebrae and frequently result in no paralysis from the injury of nerve structure at the point of fracture, but may cause injury of nerve roots as they pass through foramina. There may also result areas of hemorrhage and softening far removed from seat of fracture. The author believes cases of this nature and cases of dislocation and fracture without signs of injury to spinal cord require only fixation of the spine.

The cases of fracture dislocation of the spine with crushing of the cord and immediate loss of sensation in the joints, muscles and skin, loss of bladder control, absence of reflexes especially plantar indicates complete section of the cord and an operation is useless. It is his opinion that even in a partial injury of the cord laminectomy is of no advantage unless in both cases the fracture can not be held in position. Cases that have not been operated upon which improve and then retrogress should be studied with the radiograph to determine the possible compression of the spinal canal by callus.

Laminectomy should be performed when the vertebral archies have been driven down upon the cord relying upon the radiograph for diagnosis. He believes also that laminectomy should be performed in the first six hours where neurological examination shows a complete crushing of the cord in the cervical region. With laminectomy hemisection of the cord maybe tried in hopes of relieving the pressure upon the nerve structures by the release of the hemorrhage in the substance of the cord. He agrees with the witty writer who stated that surgeons no longer operate for fractures of the spine only some Americans do it.

Depressed fractures of the skull require an operation as shown by X-rays and by local symptoms.

Bursting fractures of the skull often require only the control of hemorrhage either arterial or venous.

Fissure of the skull may result in damage either by hemorrhage or edema. Hemorrhage requires contro by operation but edema can often be relieved by frequent spinal puncture. Great destruction of the brain substance is indicated by fixed dilated pupils, steadily rising temperature in absence of infection or in profound shock. Operation is contraindicated.

An operation is of value in fractures of the skull where no evidence of paralysis, no definite reason

for operation but the patient remains mentally slow. On opening the skull the author states that often a blood clot is found adherent to the dura.

The author states that deciding in favor of operation, the object aimed at is the relief of cranial pressure, whether due to hemorrhage or cerebral edema; and if relief of this will compensate for added risks of cranial operation it should be advised.

C. C. CHATTERTON.

THE DIFFERENTIATION OF EARLY TUBERCULOSIS AND HYPERTHYROIDISM BY MEANS OF THE ADRENALIN TEST: N. C. Nicholson and E. Goetsch (Am. Rev. of Tub. Vol. 13 No 2) describe the difficulty oft times in differentiating tuberculosis, hyperthyroidism and their combination from symptoms alone. The clinical syndrome of symptoms consisting of fatigue, asthenia, loss of weight, nervousness, tachycardia, and sometimes slight temperature may be common to both diseases.

There exists a class of patients with the above symptoms which cannot be proven tuberculous by laboratory or X-ray and which do not improve with tuberculous treatment. Another class known to be tuberculous may or may not improve with tuberculosis treatment and the question may arise whether the symptoms are due to tuberculosis active or inactive or to some other condition.

The authors believe from the work done over a period of three years by one of them that those suffering from hyperthyroidism are particularly susceptible to the administration of adrenalin thru its action on the sympathetic nervous system. These individuals react differently from tuberculous individuals in that they have an aggravation of the symptoms so often manifested in both conditions.

On this assumption a series of forty patients, 18 with a diagnosis of quiescent T. B., 16 inactive T. B., and 6 active T. B. were given a hypodermic of 0.5 adrenalin (1—1,000) and blood pressure, pulse, respiration and symptoms. objective and subjective, were carefully observed and recorded. Those cases showing an increase of ten or more points in B. P. and pulse in the first few minutes or an increase in the subjective or objective symptoms of weakness, nervousness, etc., were declared to be suffering from a more or less severe degree of hyperthyroidism. Of the 18 questionable cases 10 were thus definitely proven tuberculous, of the 16 inactive T. B., 9 were definitely proven tuberculous and of the 6 active T. B. cases all were negative. These last six reacted negatively except for a slight atypical rise in B. P. and pulse after an hour.

The authors insist that a constitutional hypersensitiveness to adrenalin indicates excessive thyroid function and maintain that "Our point is this: that it is just as wrong to say that a patient with a mild adrenalin hypersensitiveness has not a mild hyperthyroidism which may not require treatment at the time, as it would be to say that a patient had had his tuberculosis only during the time that it was clearly active."

C. B. DRAKE.

TRANSITIONAL LEUKOCYTOSIS AND ITS DIAGNOSTIC VALUE IN CHRONIC APPENDICITIS: G. A. Friedman (Am. Jour. Med. Sc. Oct. 1919) offers as a diagnostic aid in chronic appendicitis a differential count laying special stress on a relative and actual increase of large mononuclears and transitional leukocytes. There is apparently a difference of opinion as to whether the transitional is an early type of neutrophilia, or develops from the large mononuclear. The best evidence is in favor of the large mononuclear being a distinct type and not an early type of neutrophil and that the transitional cell which is a mononuclear neutrophil beginning nuclear indications suggesting an ultimate metamorphosis in the more constricted type classified as polymorphonuclear neutrophil.

The author takes as an increase in large mononuclears anything over 2 and in the case of transitionals anything over 4.

Basing his conclusions on an observation of 65 cases, he is of the opinion that an increased leukocytosis is a distinct diagnostic aid in cases of chronic appendicitis. I quote summary:

"1. Transitional leukocytosis or an increase in large mononuclears and in transitional leukocytes, or an increase in either of them, was found in the blood of 87% of patients in whom evidence of chronic appendicitis was obtained.

2. There was no transitional leukocytosis in the blood of patients in whom evidence of chronic peptic ulcer was obtained or in the blood of those in whom cholecystitis, renal stones or other organic abdominal conditions were found at operation.

3. A transitional leukocytosis was found in patients in whom appendicitis was present, with other organic abdominal conditions.

4. A hyperleukocytosis and polynuclear leukocytosis are not as frequently found in chronic appendicitis as a transitional leukocytosis.

5. A transitional leukocytosis as a diagnostic aid is superior to such roentgen signs which are supposed directly or indirectly to point to a diseased appendix.

6. Transitional leukocytosis often persists in the blood after an appendectomy has been performed."

In the body of the article, the author states that usually transitional leukocytosis disappears upon removal of the appendix.

H. B. ZIMMERMANN.

PNEUMONIAS FOLLOWING INJECTIONS OF ARSENOBENZOL: Schwerdtfeger and Tinker (Am. Jour. Syphilis; Vol. 3 No. 2) state that nine syphilitics were injected intravenously with Arsenobenzol and immediately following the injection or within a few minutes developed symptoms of irritation to respiratory organs and within a few days bron-

chopneumonia. They were all critically ill, but made complete recoveries.

The symptoms were pain in chest, cough, prostration and dyspnoea. The last symptom was extreme, the patients having to assume the sitting posture. Physical signs of bronchopneumonia developed in from one to three days in 8 out of 9 cases. In one case no abnormal signs were found but the clinical course in this case was the same as the rest. Febrile reactions were mild. The cough was short and distressing. Expectoration was bloody in four cases. The pulse ranged from 88 to 116. The highest temperature was 103.4. Cyanosis was slight in 3 cases and absent in the others. None had haemoptysis.

The physical signs were the same as in bronchopneumonia from other causes. One case showed a mild optic neuritis. The general course of the pneumonias was that of a moderately severe type. Albumin was present in 7 cases, granular casts in 2 cases, but these findings all cleared up. No haematuria or uremic symptoms were present.

The highest leucocyte count was 30,800; the lowest 8,400.

Blood cultures showed streptococcus hemolyticus in 3 cases; an unidentified diplococcus in 2 cases and were sterile in 4 cases.

The sputum contained staphylococcus in 6 cases; streptococcus hemolyticus in 2 cases, and an unidentified diplococcus in 1 case.

The water used for injection was 5 to 7 days old and contained a few Gram positive diplococci. Each patient received 0.467 Gm. on the average of the drug, dissolved in about 20 c. c. of water. All technic regular except the amount of solution given at each injection.

In conclusion the authors state the following:

1. The reactions could not have been caused by undissolved particles, as this would not have happened in all cases.

2. They could not have been caused by bacteria, as the reactions were immediate.

3. Water was not responsible as the same water had been used before.

4. The alkali was sterile.

5. All the patients had been previously treated with some preparation of Arsphenamine.

6. The technic was not at fault as the same methods had been used in 200 other cases with no ill effects.

7. The reactions were immediate and were caused by chemical irritation. The authors thought the drug was responsible.

The Surg. General's Office commented as follows: "The only explanation other than the one given which occurs to me, is that the method of giving a concentrated solution may have something to do with results. The fact that the same technic was used in 200 other cases must be considered.

From our experience it is very possible that Salvarsan will pass all required tests and still be able to produce toxic effects especially in concentrated solutions."

This arsenobenzol lot No. 907 was tested one year ago and passed a 90 mg per kilo test. This week (Jan. 25, 1919) it was tested again and passed at 100 mg per kilo. Apparently some other factor than the essential toxicity of the preparation must have caused these bad results, according to the Director of the Public Health Service.

Col. F. F. Russell calls attention to page 30 Man. of Treat. of the Venereal Diseases. 2nd edition, in which directions are given about the water to be used and also in regard to dilution. It reads as follows: "It is important that freshly distilled water be used for Arsphenamine solution. 30 c. c. of water per decigram of Arsphenamine is a safe dilution.

C. D. Freeman.

A LONG DURATION OF REMISSION IN PERNICIOUS ANEMIA: C. G. Stockton (Amer. Jour. Med. Sci. Vol. CLVIII No. 4, Oct. 1919) reports a case of pernicious anemia with a remarkable remission of twelve years, during which there was to all appearances good health. A further remarkable feature was the fact that the patient lived nearly twenty years from the time of onset of the pernicious anemia. Three years is a long time for the average case of pernicious anemia to live. Cabot has reported one remission lasting four years and a doubtful instance of six years. Cabot also has records of 37 long cases, that is, continuing more than four years; three of these lived fourteen years.

The first blood examination in Stockston's case is reported under the date of October, 1900. The red blood cell count at that time was 1,021,300, the hemoglobin 26% color index 1.3. Megaloblasts were present and there was well marked poikylocytosis. There was an irregular improvement following this for six years, at which time, although there was a moderate anemia, the blood lost all characteristics of the pernicious type. From 1907 to the beginning of 1918 the patient was considered to be well. There was then a sharp recurrence, the red cells dropping to 1,656,000, hemoglobin 28%. Normoblasts appeared. There was marked poikylocytosis and anisocytosis. Polychromatophilia was present. The case failed to respond to atoxyl and sodium cacodylate, which drugs had formerly appeared to be of benefit. Transfusion with 900 c.c. of blood led to a temporary improvement lasting only two weeks. The patient then developed lobar pneumonia and died, nearly twenty years from the recognition of the beginning of her pernicious anemia.

The writer points out, therefore, that although a patient may escape all signs of the disease (save one) for a period of ten to twelve years, yet the disease may recur.

He emphasizes that there was the disappearance of all evidence of the disease save one. That one was the continuance of achylia gastrica. In a long

series of cases he has not found an exception to the rule of the presence, sooner or later, of achylia gastrica. He believes that the persistence of this points to a close pathological relation between the stomach and the anemia. Attention, in this connection, is drawn to the observations of Seyderhelm working with larvae of the fly Estrus equi, occurring in the gastric mucosa of horses suffering from a severe anemia, in its characteristics said to be suggestive of pernicious anemia in man.

E. T. F. Richards.

THE ETIOLOGY AND TREATMENT OF KERATOMALACIA: Ronne (Klin. Monatsbl. f. Augenheilk, Vol. LVII, September-October, 1916,) believes that the pessimistic attitude displayed by most authors in the prognosis of keratomalacia is unwarranted if a timely diagnosis and appropriate treatment be established. In Denmark this malady as a rule does not arise from a grave general disease but rather assumes the form of a xerosis on a purely nutritional basis.

The cause of the condition is almost universally the same. Owing to some disorder of the bowels it is thought necessary to change the diet from milk to carbohydrates or buttermilk. The child appears to thrive on the new regime, grows fat and apparently robust. As the dietary routine is prolonged the parents observe that the patient although fat, is pale, flabby and apathetic. In the course of a few months a conjunctivitis arises so slight at first that it is given little attention. From eight to fourteen days after this there suddenly appears necrosis of the cornea and the victim lapses into a condition of moribundity from pneumonia.

Ronne has observed that milk-fed children are practically immune from this disease due, he believes, to their manner of feeding. This fact is substantiated by the fact that if during the course of keratomalacia milk in sufficient quantities be given, an almost miraculous improvement follows not only for the eye but also the general health.

Despite the statement of the parents that the child will not tolerate milk it should be given as freely as the patient can take it without regard to bowel symptoms that may arise. At first there will result a decrease in weight in the carbohydrate-fed patient owing to the loss of excessive tissue fluids by diuresis which needs cause no alarm. Unadulterated raw-milk should be used and only in the benign cases should one venture to employ it cooked.

Paul D. Berrisford.

IVORY EXOSTOSIS, GROWING FROM THE ROOF OF THE FRONTAL SINUS INTO THE ORBITAL AND CRANIAL CAVITIES, REMOVED THROUGH AN OSTEOPLASTIC OPENING IN THE CRANIUM William Lang and Donald Armour (Proceedings of The Royal Society of Medicine Vol. XII No. 7.) report a case, age 19, first seen February 19th, '18. There was a displacement of the left globe forwards, downwards and outwards which had been observed for the past six months. The vision was with correction normal, pupils equal, regular and reacted normally to both light and accommodation; there was no limitation in the mobility of the eye-ball. The roof of the orbit was depressed and felt hard. There were no subjective symptoms other than a diplopia that had existed for three months.

Examination of the nose and the nasal sinuses proved negative; an X-ray picture revealed a solid mass in the orbit. Mr. Treacher Collins recommended that the growth be removed by a surgeon skilled in cranial surgery. The operation performed by Donald Armour was most successful in every respect. The globe regained its former position and diplopia disappeared.

Description of the Operation.

The surgical problem that presented itself was the most desirable method of approach to the tumor with the least possible damage to the cranial and orbital contents. After viewing the X-ray plate the surgeon determined that the same method should be employed as in the removal of frontal tumors.

He made an osteoplastic flap with its base at the supra-orbital margin, turning down the scalp and the bone together. The cranial portion of the tumor which pushed up the under surface of the frontal lobe then came into view. By displacing the dura and the brain gently backwards, the whole extent of the tumor's cranial portion could be seen. The surgeon determined that the tumor was fixed to the supra-orbital margin but later discovered his mistake on attempting its removal. He sawed the supra-orbital margin in both sides of the growth but upon removing this wedge of bone it separated cleanly from the tumor and adhered to the periosteum. The neoplasm was then removed by means of a chisel, and hammer, and a cutting forceps. The operation was completed by replacing that portion of the supra-orbital margin removed during the operative procedure and suturing the displaced bone flap and scalp into position.

The intracranial portion of the tumor was smooth, white and ivory-like while the intraorbital part was covered with mucus membrane. The tumor had evidently arisen from the frontal sinus.

Paul D. Berrisford.

TRANSFUSION OF BLOOD IN PERNICIOUS ANEMIA: J. M. Anders (The American Journal of the Medical Sciences, Vol. CLVII, No. 5) believes from his own experiences and from a study of the literature that transfusion offers more for pernicious anemia than any other form of treatment. It is highly probable, he believes, that transfusion of blood in this disease owes its beneficial effects principally to stimulation of the anti-hemolytic properties of whole blood, although possibly also to some extent to its power to increase the activity of the bone-marrow.

The 459 cases reported in the literature in which

1,048 transfusions were performed, is a large enough number to base on which a fairly accurate estimate of the value of transfusion as a remedial measure. Considerable light has been thrown upon the question of the duration of remissions by transfusions by these observations, although the reports are too often silent on this phase of the effects of the procedure. Of 362 cases in which the result was given, 204, or 56.3 per cent., showed an initiation of remissions. Cases in which the improvement was brief and might have been ascribable to the mechanical effects of the transfusion were not included in the figures representing remissions. It is worthy of note that the average number of transfusions per patient was 2.4, while the extremes ranged from 1 to 20 transfusions.

Weber, Hurter, and others have, as a result of personal observation, reached the conclusion that repeated smaller transfusions, e. g., "200 to 500 c. c.," which are free from dangerous reactions, give more satisfactory results than single, massive ones. The series of cases which make up the table accompanying the writer's article confirm this view. Single transfusions, however, prove sufficient in a certain percentage of cases (11 out of 26, Archibald). The determination of the precise amount of blood to be transferred is a question requiring further study and investigation. Of 185 cases in which the method was mentioned, 172 were transfused with citrated blood.

In this connection Vogel and McCurdy conclude, as the result of their studies that "The enumeration of the reticulated cells by means of the method of vital staining affords a useful means of gauging the hemopoietic activity of the bone-marrow, and by watching the patient's progress in this way the indications for and effects of various therapeutic measures can be well determined and supervised." The intervals in the case of multiple transfusions, must be determined by repeated examinations of the patient's blood, preferably by the method of Vogel and McCurdy, since this is the only trustworthy method of estimating their effect. Obviously, the patient's general condition and subjective sensations must likewise be taken into account.

In the case reported by the writer, which had reached an advanced stage before the procedure was resorted to, the effects of the first transfusion were decided and lasted about eight months, and a second transfusion gives promise of an equally favorable result. As a means of establishing a reputation for the procedure, however, the limitation of its use to well-night hopeless cases is not promising. The present researches indicate clearly that earlier transfusions in cases showing no tendency to spontaneous remission or as the result of the more usual methods of treatment would yield the best results. Again, remissions are more easily induced in the earlier than the later stages of the disease.

Transfusion does not prolong the period of remission. Cabot's figures show the quiescent period to be over 6 months in 165 out of 329 cases, whereas in the writer's series, and so far as could be ascertained from the literature, it was somewhat shorter. On the other hand, this measure easily brings about an increased number of remissions, hence it is not unreasonable to suppose that the total duration of life may be thereby prolonged. Evidence exists to show that those cases of the disease which have shown most improvement after transfusion had run a prolonged course as a rule, while the more rapidly progressive cases manifested a feebler remission.

The writer concurs in the opinion expressed by Kimpton that the results of splenectomy do not warrant the operation. This view is based on the assumed facts that transfusion offers quite as much as splenectomy, "with or without transfusion" (Kimpton), and that it obviates immediate deaths. The belief among certain observers that transfusion following splenectomy brings a more steady response than without splenectomy is not borne out by experience.

Krumbhaar, in a series of the late results of splenectomy in 153 cases, noted a mortality rate of about 20 per cent., and also that, as a rule, the improvement was transient. Moffitt, in an earlier article, states that of 33 cases of splenectomy for pernicious anemia gleaned from the literature, including one under his own observation, "eight died immediately or not long after the operation."

E. T. F. Richards.

THE PERMANENT CURE OF INGUINAL AND FEMORAL HERNIA: A modification of the Standard Operative Procedures. By G. Paul LaRoque, M. D., F. A. C. S., Richmond, Virginia. Surgery, Gynecology and Obstetrics. Volume XXIX. No. 5, November, 1919.

The author describes the following technique; "the usual incision through skin, superficial fascia and aponeuroris exposes the inguinal canal containing the hernial sac and cord. With blunt forceps or scissors inserted between the muscle bundles of the internal oblique and of the transversalis and its fascia about an inch above their lower margin, the bundles are separated in the usual muscle-splitting fashion making a good exposure of the peritoneum well above the neck of the sac. In cases where the muscles are attenuated the arching portion of the internal oblique and transversalis may be retracted to a suitable position well above the neck of the sac. The peritoneum is then picked up and opened in the usual way. The neck of the hernia is adequately exposed from within the general peritoneal cavity. Adherent bowel and omentum are completely and easily removed and careful exploration of this region of the abdomen is made. In certain cases of small size narrow hernia and especially when the repair of the hernia is apart of some

operation upon pelvic organs performed through a median incision, the neck of the sac may be tightly sutured, the redundant peritoneum in the region taken up and tightened by two or three rows of sutures and the small narrow hernial sac safely left in situ. The finger inserted from above through the incision in the peritoneal cavity into the sac, permits easy and complete enucleation of the sac from the spermatic cord, bladder and large blood-vessels for a much higher distance than is ordinarly accomplished by enucleation of an empty sac from below. The bladder, vas deferens, and other structures are constantly in plain view and thus adequately protected against injury. With forceps introduced from the outside, against the finger within at the lowest portion of the sac, the sac is pushed upward and turned inside out into the peritoneal cavity and through the primary incision well above the neck. With the sac and redundant peritoneum in the region pulled well upward, the bladder and vas in full view, sutures are placed in the peritoneum well above the neck of the sac and to the upper edge of the original incision in the peritoneal cavity. By thus placing the sutures an inch or so above the neck of the sac a high ligation of the sac and redundant peritoneum in the region is insured. This suturing completely obliterates the internal ring and lifts the proximal portions of the spermatic cord well above and external to its original location, transplanting it from within. The sutures should also include a small portion of the transversalis fascia which has been inverted with the sac. In hernia of small size in which the amount of tissue is not excessive the sac may be allowed to remain after ligation and the split muscle sutured over them."

He has been employing the procedure with progressive satisfaction for some seven years, at first in cases of strangulated and complicated hernia, then in dealing with hernia in women while operating primarily for pelvic disease, and finally as a routine procedure in all cases of inguinal and femoral hernia.

GEORGE EARL.

ANGIONEUROTIC EDEMA: A preliminary report. Chas. R. Austrian. (South Med. Jour., July, 1919.) Starting with the dictum that angioneurotic edema is not a disease but merely the symptom of (1) allergy or anaphylaxis, or (2) infection, or (3) endocrine disturbance, or (4) thermic influences, or (5) metabolic changes, or (6) idiopathis origin, the author cites two cases of his own and quotes from some of the literature.

Case I is of the anaphylactoid type and is worth quoting in brief: "The patient, a young man of 22 years, presented with a very marked itching and pale swelling of the scrotum of a few hours' duration. He reports various evanescent swellings of the forearms during the past several days and this morning there was a white painless swelling of the upper lip. A very thorough physical examination is negative except for this swelling of the scrotum and dermographia. The swelling of scrotum was relieved by Tinct. Bell. M V t. i. d. but recurred the following day. Five days later on awaking patient's tongue so swollen that speech was impossible. Patient attributed the symptom to eating lobster salad before retiring. Condition greatly relieved by hypo. of adrenalin.

Intradermic tests with extracts of milk, egg white, chicken, beef, negative, while extracts of oyster, lobster and fish caused slightly greater reactions than the controls.

Patient not seen for 8 months during which time he continued to have numerous swellings of hands, feet, lips and eyelids, occurring at intervals of from 1 to 2 days and relieved by adrenalin hypodermically. An intradermic injection of extract of fresh unsalted ham gave rise to a very marked local reaction with an indurated wheal 6 times the size of the control and a blotchy erythema that spread almost to the shoulder. The reaction reached its height in 45 minutes and lasted for 36 hours at site of the injection. Following this reaction all foods derived from the pig were withheld from the patient's diet, no other change being made and no medicine given. Patient was free from symptoms for next 4 months. After eating a ham omelette he got another attack, the first in 4 months. He likewise states that when he eats food fried in lard he develops small swellings on the hands and feet.

Seven months later, before joining Marine Corps, patient tested himself out by eating several slices of ham. Within a few hours he had an edema of the entire face. When heard from 9 months later patient had had no major attacks and only twice had small swellings appeared on dorsum of hands and these followed the ingestion of food cooked with ham fat."

The author mentions 4 similar cases, one of which reacts to an extract of white beans, another to fish, the third to veal, and the fourth to strawberries.

The author reports in detail another case of daily attacks of urticaria sensitive to rye, wheat, egg, milk, timothy, orchard grass, poplar, beef and salt solution 0.9 per cent. 4 abscessed teeth, as shown by X-ray, were pulled and within a few days all urticaria subsided to return no more.

He further quotes the work of Miller & Pepper on a patient with an obscure type of angioneurotic edema who showed a nitrogen retention and reduced sodium chloride elimination preceding the attacks, which is not true in the intervening periods. The patient was benefited by a low chloride intake.

CHAS. N. HENSEL.

LOCAL ANAESTHESIA AND THE MASTOID OPERATION: M. A. Goldstein, M. D. (The Laryngoscope, October, 1919, Vol. XXIX No. 10.) reports results in 20 cases of acute mastoiditis operated upon under local anaesthesia at Camp Dodge Base Hospital. The principal upon which local anaesthe-

sia is based depends on the diffuse and constant pressure on the nerve distribution in the skin and secular tissues as developed by Schleich and since anaesthesia depends entirely upon diffuse pressure on the nerve end organs and not on the character or strength of anaesthetic used distilled water or any weak local anaesthetic may be available. With regards to technic for injection in these cases a 10 Cc. all metal syrings with metal plunger and needle 2½ inches long was used, the anaesthesizing solution being one-half of one per cent novocaine in distilled water to which is added 1-10000 solution of adrenalin in equal parts, the solution is rendered sterile by boiling in an Erlenmeyer flask.

With a standard hypodermic syringe and needle a subcutaneous injection beginning with mastoid area in zygomatic line is worked toward the mastoid tip. The infilteration includes a belt of one inch in width extending from the insertion line of auricle backwards and parallel to it. The deep injections are then made with the heavier syringe beginning at same point covering the mastoid tip at four points. The needle is plunged in a slanting direction downwards until the point engages the mastoid bone and the needle is worked between the periostium and bone, 5 or 6 Cc. of fluid being injected into the area, the other three points from the zygomatic line are injected in the same manner. A complete anaesthesia is thus effected throughout the field of operation.

With one sweep the classical incision is made down to the bone, before elevating the periostium forwards and backwards a pledget of cotton saturated in 10 per cent cocaine is allowed to remain in site for five minutes.

As the posterior wall of the auditory canal and middle ear cavity are still sensitive and injection needle is passed to the depth of the mastoid incision between the periostium and bone and carried to the fundus of the canal as far as possible, 3 Cc. of novocaine solution are injected at this point.

This suffices for simple mastoid cell exenteration and drainage of the antrum, for the radical operation further injections are necessary to insure anaesthesia of the tympanic membrane and tympanic cavity, after infiltration the technique is no different than that employed under general anaesthesia.

It is interesting to note that in this series of twenty cases 60 per cent were secondary to the Flu; 20 per cent secondary to measles; 20 per cent secondary to throat infections of no specific cause. Laboratory diagnosis of pus removed from the mastoid proved all infectious to be Streptococcus Hemolyticus. Fifty Cc, was the average amount of novocaine solution used and while the intensity of the infection varied all of the cases made complete and uneventful recovery. GEORGE C. DITTMAN.

CYTOLOGICAL STUDIES OF PLEURAL EXUDATES COMPLICATING INFLUENZA: Luke and Barker (Am. Jour. Med. Sc. Vol. 158, No. 4.) report their findings in the study of 17 cases where the fluid was obtained at autopsy. The amount obtained varied from 50 to 3,000 c.c. and in the cases of shorter duration was thin, serosanguinous or seropurulent and in the cases of longer duration was more often purulent and thick.

In ten of the seventeen cases over forty per cent of the cells were of the endothelial type as described by Mallory, being 10 to 20 microns in diameter and possessing a large pale staining nucleus which in turn contained one or more nucleolus staining darkly. In 5 per cent of cases this endothelial cell constituted over 70 per cent of the cells, while the large and small lymphocytes generally constituted less than 10 percent of the cells. As a rule the polymorphonuclear cells constituted the bulk of the cells not mononuclear. In cases of shorter duration the mononuclear cells predominated while in those of longer duration and particularly where frank pus existed the P. M. N. cells formed a larger proportion.

The bacteriological findings were uncertain, were not related in any way to the sell findings and consisted of hemolytic and non-hemolytic streprococci, pneumococci and the Bacillus influenzae. This leads the authors to conclude that the character of the fluid is primarily produced by the soluble virus of the influenza bacillus. Phagocytosis was found in 9 cases and mostly occurred in P. M. N. cells.

Mallory has called attention to the fact that endothelial cells are called forth by mildly injurious agents such as the lepra, typhoid and tubercle bacilli. The authors call attention to the similar characteristics of typhoid and influenza. In each there is a leucopenia and a proliferation of the lymphoid tissues. In typhoid the intestinal and mesenteric lymphoid structures are markedly enlarged. In influenza the peribronchial and peritrachial nodes are highly swoolen and packed with endothelial cells. In both there is an enlargement of the liver and spleen with toxic changes in both organs. In 126 influenza livers the authors found focal necrosis in 50 per cent. C. B. DRAKE.

SURGICAL TREATMENT OF CANCER OF THE TONSIL WITH REPORT OF CASES—John McCoy, (The Laryngoscope July, 1919, Vol. XXIX No. 7) describes a method for removal of the carcinomatous area. An incision about 2.5 to 3 inches long is made at the anterior border of the sterno-mastoid muscle. The glands about the jugular are dissected out, the facial vein is ligated in two places and cut. The external carotid artery is digated. Dissection is carried up to the digastric muscle, this with the stylohyoid and styloglossus are pushed aside. Through the mouth the tonsil and infiltrated areas are dissected out, infiltrated tissue is especially looked for at the base of the tonsil where it connects with the tongue. The wound is partly closed, packed with gauze and allowed to heal by granulation. Radium is applied as an after treatment. In four cases operated upon in this manner the results are very favorable after one and two years duration.

GEORGE C. DITTMAN.

BOOK REVIEWS

THE OPERATIVE TREATMENT OF CHRONIC INTESTINAL STASIS. By Sir W. A. Lane, Bart, C. B. Henry Frowde, Hodder & Stoughton, London. 1918. $7.00.

In the preface to the fourth edition of this book Mr. Lane states that "of all physical conditions arising out of the evolution of the human race, none is so fundamentally important to the organism as chronic intestinal stasis."

He gives a very elaborate and detailed account of the mechanism of intestinal stasis. He believes that every change in the anatomy of an individual to enable him to accommodate himself more efficiently to his surroundings also tends to shorten his life. The various bands which develop within the abdomen he regards as a "crystallization of the lines of force, 'Jackson's Membrane' is an example of the formation of these bands."

As a consequence of the infection of one's food supply, changes take place in the contaminated contents of the small intestine, resulting in flooding the circulation with toxins or organisms in excess of what can be dealt with by the liver, skin and kidneys. These toxins are what produce the degenerative changes in all textures of the body and tend to shorten the life of the individual. One can not estimate the amount of damage that these poisons are capable of inflicting—but it can be demonstrated how wonderful a change takes place upon proper operative procedures. He uses as examples the effects of colectomy in Still's Disease, Rheumtoid, Arthritis and Raynaud's Disease.

The book contains chapters by Nathan A. Neutch, M. D., on the Bacterio-Chemistry of the small intestine,—another by Sir James MacKenzie on Diseases of the Heart,—another on the "The Great Bowel from an anatomist's view point by Arthur Keith. Dr. Adams also contributes a chapter.

W. C. Carroll.

TRENCH FEVER. By W. Byam, Major, R. A. M. C. Henry Frowde, Hodder & Stoughton. London. 1919. $4.25.

A compendium on trench fever with numerous experiments confirming the convictions and conclusions of the authors.

In brief, experimentation and observation has shown that the louse, at least partially, is guilty in the production and transmission of trench fever. The virus remains in the peripheral blood of a patient at least 300 days after infection. It is, however, destroyed by the addition of large amounts of distilled water to the circulating blood. Only lice fed on trench fever patients are capable of producing the disease. It may be added that the excreta of infected lice when applied to an abraded skin or conjunctiva, will produce the malady without the presence of lice. The lice do not transmit the disease to their offspring and are not infectious for at least 5 days after the first feeding on a trench fever patient. One louse is sufficient to initiate the disease, and at present, it is unknown what percentage of lice do get actually infected. The excreta of infected lice are infective at least 120 days. Individual peculiarities, virulence, size of dose, may explain variations in trench fever and its incubation period which may be anywhere from 5 to 30 days, usually 8 days. In the opinion of the authors, the bites of lice serve as lesions through which the excreta enter and cause the disease. Both the head louse and the body louse equally well convey trench fever.

Natural immunity is questionable, and an attack of trench fever may confer it for 6 months, or possibly longer. Richettsia Bodies appear constantly after a suitable lapse of time in lice fed on trench fever patients, and their absence in lice fed on healthy individuals is noteworthy, but their significance is unknown. To the well known louse diseases; namely typhus and relapsing fever, now belongs also trench fever to which has been attributed the D. A. H. (disordered action of the heart), of which the most common symptoms are; exhaustion, giddiness, fainting, headache, breathlessness, pain, irritability lassitude, sweating coldness of extremities palpitation, cardiac irregularity, and fever. The prognosis depends on the past medical history, number of attacks, early rest after onset, and individual recuperative capacity. No specific treatment is known, hence prophylaxis is all important and consists essentially in exterminating the lice and proper destruction or disinfection of their excreta. Numerous methods and their effectiveness and practicability have been proposed for this purpose, showing that 70° C. wet heat for 30 minutes is very proficient.

The appendix contains elaborate charts and tables with minute details of all the experiments undertaken by the authors in the study and investigation of trench fever.

John A Lepak.

THE NERVOUS HEART. By R. M. Wilson, Captain, R. A. M. C., and John H Carroll, Major, M. C., U. S. A. Henry Frowde, Hodder and Stoughton, London. 1919. $2.50.

In this volume, Wilson and Caroll discuss in some detail a disease known for a long time. Its origin, however, has been attributed to many greatly variable and changing causes. These authors, after a somewhat prolonged period of study, observation and experimentation, favor the neurogenic basis of causation. The whole burden of disturbances falls upon the autonomic sympathetic nervous system. From the disproportion or unbalance in action of the two sets of fibres (vagus depressor and adrenalin sympathetic) diametrically antagonistic to each other in action arises the malady known here as "The Nervous Heart", and elsewhere designated by various names, some of which are; "Neurocirculatory

Asthenia," "Soldier's Heart," Irritable Heart of the Soldier," "Irritable Heart," "Disorders Affecting the Heart," "Effort Syndrone."

The nature of this condition will be best understood, the authors state, if one keeps in mind that the human system is properly held in equilibrium by three large lakes, (the peripheral lake, the pulmonary lake, and the mesenteric lake). Furthermore, it is almost unnecessary to say that the body remains at any moment in one of two states. One of these is known as the "reaction state" or state of activity, the other as the "rest state" or time during which it is at rest. During rest the vagus depressor mechanism predominates and the "blood lakes" as a result are dilated or opened. During activity when blood is required in large amounts by the muscles and the brain, on the contrary, the "blood lakes" are partially or almost totally closed. The rapidity, success, harmony or discord of the nervous apparatus controlling these lakes gives origin to the various emotions and their intensity, quality and variation. Very frequently the resulting symptoms or signs of emotion are almost alike, that is, one may simulate another, e. g. as the presence of pallor both in fainting and in anger. And yet the pallor in each of these conditions is due to diametrically opposing nervous mechanisms. In fainting, the vagus depressor mechanism has conquered totally the "true or adrenalin sympathetic." The patient is pale, not because the vessels of the skin are contracted; on the contrary, the vessels are dilated but they are empty. Not only are the muscles and the brain bloodless, but most of the blood also has been driven out by the vagus depressor mechanism from the "peripheral and pulmonary lakes" into the "mesenteric lake." Since there is little blood present in the skin, muscles and brain, the patient is pale, weak and faints. During anger pallor also appears, but this pallor is a result of the "true or adrenalin sympathetic" domination. Here the pallor is due to the constriction of the blood vessels. The blood lakes are narrowed, diminished in size or closed; and the blood is forced to the muscles and the brain, hence the individual's courage increases, strength, vigor and power multiply and simple confidence may be transformed into a daring audacity. Inability to mobolize the blood from the "lakes" to the muscles and the brain gives fear, anxiety and distress, their severity depending on the extent of failure. The more powerful the action of the vagus depressor, the more powerfully will "adrenalin sympathetic" try to react by equalizing or better yet, by subordinating its apponents. And thus ones imagination can only tell what kind of emotional outbursts will be the outcome from such a complex action of forces. Vagus depressor predominance means fear, and adrenalin sympathetic predominance, confidence. How many other emotions with their variations can there be between these two, each at the extreme end of the opposing pole?

The over-excitability and instability of this not clearly understood complex action of the autonomic sympathetic nervous system, the authors propose, is due to several factors of which the most prominent are:

1. Toxins, endogenous or exogenous.
2. Environment, unpleasant and disagreeable.
3. Infections, especially rheumatism and trench fever, but any infection will do under favorable circumstances. Numerous examples and experiments have been cited to prove these contentions. Clinically, the disturbance of this nervous mechanism has given as the most common symptoms; slight temperature, a variable pulse, breathlessness, giddiness, precordial pain, blushing, flushing, weakness, excitement, sweating, tremulousness, palpitation, fatigue and drowsiness.

The prognosis of such cases will depend entirely on the removable or irremovable character of the causative factors, and furthermore, upon the severity of the symptoms and the patients co-operation in steadfastly resisting any backward drawing reactions.

The treatment of nervous heart has been divided by the authors into three parts.

1. Removal of the cause.
2. Palliative treatment. This consists essentially in lowering the irritability of the vagus depressor and increasing the response of the adrenalin sympathetic, by removing unpleasant circumstances.
3. Tonic of thyroid extract, one to ten grains daily.

In conclusion, it must be remembered that the past medical literature has exponded this very same disorder:

1. On the chemical basis, as an increase or decrease of certain salts.
2. On the endocrine system as a disparsity in secretion of the internal secretory glands.
3. On the "inferior instability" of the nervous system usually considered hereditary. The authors have practically combined all the above theories in their explanation of the nervous heart in such a manner that the book is not only pleasant reading and interesting, but also most logical and convincing.

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ORIGINAL ARTICLES

THE EARLY DIAGNOSIS OF THE MALIGNANT THYROID—ESPECIALLY CARCINOMA.

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The thyroid gland originates in front of the so-called tuberculum impar of His from which the the foramen caecum is formed by an evagination of epithelium of the anterior pharyngeal wall. This is in the mesobranchial field at the level of the second branchial arch. From it, leading through the root of the tongue, toward the thryoid bone is a depression which grows to be the epithelial-lined thyroglossal duct.

Occasionally the evolution of this structure or tract does not run its normal course. It may remain patent or its epithelial cells may grow irregularly, so that islets of thyroid cells are present to become the future beginnings of possible goiters or tumors. Similar tracts of epithelium are to be found reaching from the dorsal culdesac of the third branchial groove, to the ventral culdesac of the third and fifth branchial grooves, where the upper and lower parathyroid and the thymus postbronchial bodies are formed.

"The thyroid," "passes through three different stages: (1) the embryonic, or thyroglossal stage; (2) the fetal stage, still colloid free constituting an undifferentiated cellular mass; and (3) the adult, or vesicular stage."

These few remarks will suffice for orientation as to the origin of the various cells of which the malignant tumors are composed. It is not so easy to separate the malign from the benign growths. Various forms of caricinoma of the thyroid may enlarge expansively for a period of months. That constitutes their intracapsular period. The stamp of malignancy is upon any given tumor in a given organ when it gives rise to metastases and when growth is accelerated without any apparent reason. The secondary tumors of malignant goiter have a characteristic and peculiar tendency to reproduce physiologic thyroid, so much so that the metastatic growths may take on full function after extirpation of the gland itself.

TABLE I.
MALIGNANT TUMORS OF THE THYROID GLAND

1. Epithelial in Origin (Carcinoma)	2. Arising from Connective Tissue (Sarcoma)
Proliferating Goiter, or Malignant Adenoma.	Fibrosarcoma.
Carcinomatous Goiter.	Round Cell Sarcoma.
Parastruma (Kocher)	Myxosarcoma.
Postbranchial Goiter (Getzowa.)	Endothelioma.
Papilloma.	Perithelioma.
Metastatic Colloid Goiter.	Polymorphous Cell Sarcoma.
Cancroid.	

The history of cancer of the thyroid is intimately connected with that of goiter. A map drawn of the various countries to show the prevalence of goiter would serve also to visualize the frequency of *struma maligna*. The incidence of benign tumors and that of malignant growths undergo parallel oscillations. Where goiter abounds, cancer of the thyroid is frequent. "Lyon, says Carrel[2], is favored with many malignant strumae, from twelve to fifteen a season." Delore[3] saw forty cases in the same clinic in three years. The explanation of this frequency is found in the fact that the city is situated in a goiterous country, and also because the work of its many surgeons called attention to the pathology of the thyroid gland, so that the malignant cases became better recognized.

In 1907 Kocher[4] reported the occurrence of about 400 cases of malignancy in something more than 4,500 operated goiters. He, the great master of goiter work, complains bitterly that the diagnosis of malignant disease is made too late, when with a little more search, care, and understanding the situation could easily be otherwise.

Judd[5] encountered 5 cases of sarcoma and 105 cases of carcinoma from 1905 to 1916. In an extensive report Muller and Speese[6], of Philadelphia, make the following statement: "Malignant disease of the thyroid gland is not a common disease in this country, where only 11 sarcomata have been reported."

In an effort to ascertain its incidence locally, the author has made inquiry of eight leading surgeons in Minneapolis and St. Paul who reported[7] 22 proved cases during the last five years.

Women have goiter far more often than men; the incidence of cancer is likewise greater in women. Muller and Speese give the ratio as 3:2; Delore, 4:1; Orcel[8], 14:6; Carrel-Billard[9], 5:3.

The most favorable age for the incidence of

cancer of the thyroid is from 40 to 70. In 102 cancer patients Carrel found 2 below the age of 20, and 7 more than 70 years of age. Gruie and Bard[10], who describe latent cancer, *cancer medical*, did not find it in a single patient under the age of 50. Lucke[11] reports a sarcoma in a patient 3 years of age; Delore reports one at 16 and another at 15 years of age.

TABLE II.

MALIGNANT TUMORS OF THE THYROID

Cases of Erhardt, and Muller and Speese.

Age of Incidence	Carcinoma	Sarcoma
1 to 10 years	0	0
10 to 20 years	5	2
20 to 30 years	14	10
30 to 40 years	34	12
40 to 50 years	44	30
50 to 60 years	50	30
60 to 70 years	28	24
70 to 80 years	4	2
80 to 90 years	1	0

A total of 290 cases, 213, or 73.5 per cent occurring after the age of 40 years.

The malignant struma, then, develops only occasionally at the age of puberty; the veritable period begins toward 40 and extends to 70, with the maximum frequency around the age of 50.

The metastases of tumors of the thyroid, whether of epithelial or connective tissue origin, take place, not, as usual, sarcoma by the blood vessels and carcinoma by the lymphatics, but their dissemination occurs without choice by either channel.

TABLE III.

MALIGNANT TUMORS OF THYROID GLAND

General Metastases in 238 Cases of Erhardt, and 19 Cases of Muller and Speese

Location	Carcinoma	Sarcoma
Bones	19 (29%)	24 (18%)
Lungs	72 (48%)	65 (42%)
Liver	5	16
Kidney	14	10
Brain	7	7
Pleura	12	6
Myocardium	1	4
Adrenals	1	2
Pericardium	1	0
Spleen	0	1
Omentum	3	0
Intestine	1	0
Ovary	1	0
Mamma	1	0
Stomach	1	1
Esophagus	1	0

TABLE IV.

REGIONS OF METASTASES IN BONES

In 65 Cases of Erhardt and 10 Cases of Muller and Speese.

Skull	31	Humerus	10
Inferior Maxilla	30	Pelvis	9
Sternum	18	Scapula	4
Vertebrae	16	Clavicle	1
Ribs	12	Palate	1
Femur	11		

TABLE V.

COMPARATIVE BONE METASTASES (KOCHER.)

Incidence in Stomach Cancer	0.9%
Incidence in Uterus Cancer	5.7%
Incidence in Esophagus Cancer	2.2%
Incidence in Thyroid Cancer	36.9%

"At the Lyon Clinic," says Carrel Billard, "the patients often observe some infectious disease just about the time of the development of the malignancy. Many times an enlargement of the neck starts after an attack of la grippe."

"This influence of infection is real," asserts Carrel, "We do not believe that it is a mere coincidence."

Poncet[12] in the same clinic had observed long before the existence of an intimate relationship between some inflammatory condition of the pharynx or tonsil and certain tumors of the thyroid.

It is not common for a neoplasm to start in a healthy thyroid; usually it grafts itself upon a previous goiter more or less ancient. Carrell found pre-existent goiter in 75 per cent of his cases. In 11 cases out of 14 Delore found it superimposed on goiter; while Erhardt[13] and other authors give similar proportions. Muller and Speese, quoting Erhardt, state that goiter had existed from 1 to 10 years in 33 cases; from 10 to 20 years in 21 cases; from 20 to 30 years in 16 cases; from 30 to 40 years in 9 cases; and from 40 to 50 years in 9 cases. Van Straaten[14] in 72 cases saw 30 cancers in the right lobe, 20 in the left, and 2 in the isthumus.

TABLE VI.

MALIGNANT TUMORS OF THE THYROID

Superimposed on Pre-Existing Goiter

Of 200 Cases of Erhardt and 42 Cases of Muller and Speese Goiter existed previously in 82, 3.4 per cent

Goiter had existed from 1 to 10 years in 33 cases.
Goiter had existed from 10 to 20 years in 21 cases.
Goiter had existed from 20 to 30 years in 16 cases.
Goiter had existed from 30 to 40 years in 9 cases.
Goiter had existed from 40 to 50 years in 3 cases.

Sometimes the whole gland becomes involved in a rapid malignant degeneration, a process clinically known as acute cancer. Bertrand,[15] Rollet,[16] and Rabe[17] describe the occurrence of this condition in younger individuals. Tumors may occur outside of the thyroid region wherever there are embryonic remnants.

Concerning the histology of the epithelial tumors, we may follow the grouping by Langhans[18] whose magnificent researches have been accepted abroad by Kocher, and in America by Crotti. From a few plates after Langhans the following classification is made:

1. *Struma proliferans.* The nodes are large and rounded, 10 to 15 cm. in diameter. They are encapsulated, and in the center is a stellate scar. The bulk is composed of cells in polyhedral fields or in narrower radiating stripes. Within these fields or stripes are septa of chink-like vessel lumina. The growth is a continued change; segregating groups occur; acini form with lumina having a colloid filling and a single epithelial cell lining; or it may be a colloid ball appears first, around which the cells align themselves. After the cell arrangement is completed, the stroma follows, so that a screen-like appearance results. The tissue so formed resembles normal thyroid parenchyma and is almost identical with colloid goiter. The cell groups, the arrangement of the new acini, the peculiar stroma, are the salient features. Langhans denies frequent invasion of the lymph gland,

while Kocher expresses the opposite opinion. Langhans always finds invasion of the neighboring parenchyma within the gland.

2. *Carcinoma.* This is so called because these tumors show the same characteristics as to relation of cells and stroma as seen in the cancers of the breast and of the stomach. There is the same lawless and irregular ingrowth of epithelium into the connective tissue stroma. On section the cell nests appear in the more or less loose connective tissue; the softer they are, the thinner and more scarce is the stroma,—the medullary type. When the connective tissue is markedly heavy and the cell nests are few, it is termed scirrhus. Metastases occur early and occur in the glands of the neck and the bronchial and mediastinal glands.

3. *Metastatic Colloid Goiter.* No sign of neoplasm is seen in the colloid goiter itself. Capsule, blood vessels, lymph channels are found intact. The malignancy lies in the metastatic growths in the bronchial glands and the mediastinum. These cases often come to autopsy without previous operation or diagnosis.

4. *Parastruma.* Ten cases of parastruma are reported by Kocher. Tumors of the parathyroids contain glycogen. *The colloid is absent.* Large clear cells with the nuclei at the free pole are characteristic. They originate in the squamous epithelium lining the canals connecting the parathyroids and the thymus, and persisting within the parathyroids.

5. *Postbranchial Goiter.* A large cell, small alveolar struma, described by Getzowa[18] arises from postbranchial body cells. The metastases in the lung and in the liver show the same structure.

6. *Papilloma.* The nodes are smaller than in any other form of malignancy. There are hollow spaces, 2 mm. in diameter, into which the papillae grow. The cells are cubical, cylindrical, or may even be squamous in type. On the papillae the cells are tall and large, but on the walls of the spaces are flat. The structure looks like a cyst from the wall of which the papillary tree grows inward. The cylindrical cells look much like the tall cells in the hyperplastic acini of Graves' disease, which may explain the occasional occurrence of Basedow's symptoms with this type of cancer.

7. *Cancroid.* According to Crotti, this tumor never reaches very large proportions; it is hard and has an irregular surface; it has the same appearance histologically as cancroid of the skin, mouth, or other organs. Broad, solid cords of irregular size and form are embedded in a more or less loose connective tissue. The cells are polyhedric, with abundant protoplasm. Cancer pearls are numerous. According to Langhans, they originate from the thyroglossal tract remnants.

It seems reasonable to assume that invasion by a neoplasm would cause some change in the secretion of the thyroid gland. Renaut[19] speaks of these changes as adulterations. Hyperthyroidism and dysthyroidism have been observed. Suppression and hypothyroidism are not observed because the metastatic growths take up the function of the thyroid gland. Signs of hypothyroidism have been noted in such cases only after extirpation of the metastatic process.

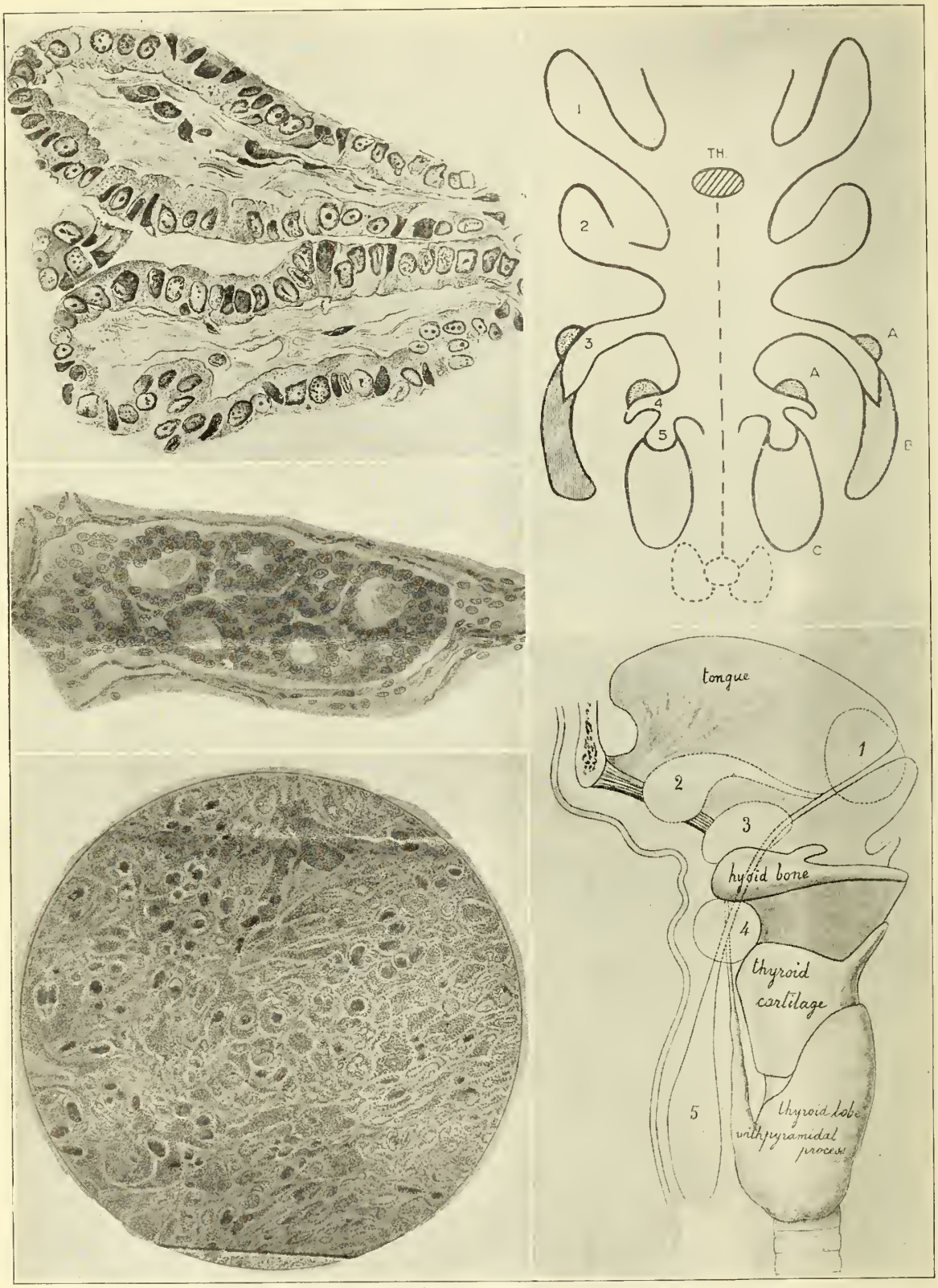
Renaut has shown that the secretions in newly formed follicles is not the same as that in the old ones. The former does not take up much eosin, and is identical with the material found in the thyroid of a fetus of six months. Renaut calls it thyromucoin, and the substance of a normal gland, which corresponds in every sense to colloid, he names thyrocolloine. Kocher calls attention to the resemblance of hyperplastic goiter to some cancer cells.

The general symptoms which accompany malignant goiter present a special physiognomy in accordance with the functional transformation of the gland. Such signs are cardiovascular disturbances, tremor, exophthalmos, and rapid loss of flesh. Surgically the subject may be considered under two heads: (1) the intrascapsular stage, and (2) the extracapsular stage. Clinically, there are three types: (1) the latent, (2) the acute, and (3) the subacute *struma maligna.*

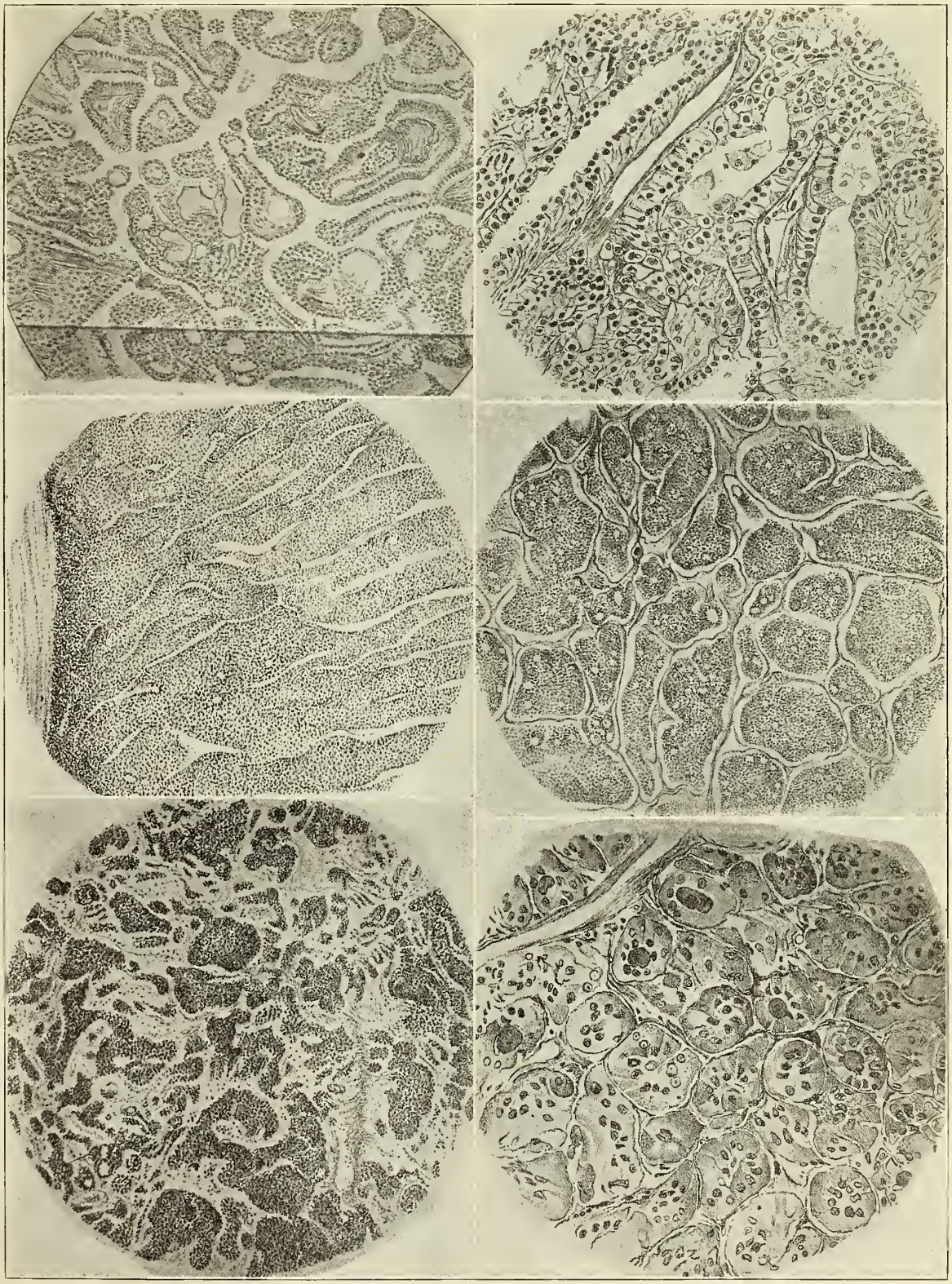
Latent thyrocarcinosis, like latent cancer of the stomach, is seldom diagnosed. Gruic has named it "cancer medical" because it is so often unrecognized and is treated medically until the patient dies from metastasis in the lungs, liver, or bone marrow. He describes the symptoms in nineteen cases, only one of them under 50 years of age. The most frequent symptom noted is a continuous loss of strength, though the patients eat their food with undiminished appetite, and digestion is regular and free from disturbance. Careful questioning usually elicits the fact of the goiter having slightly increased in size as evidenced by an uncomfortable pulling and drawing in that region, but there is absence of pain. The loss of flesh is gradual. By and by some neuralgic pain develops, and some impediment of respiration is experienced, with light attacks of smothering on lying down.

At this stage it is still possible for the patient to take a fair degree of exercise without stopping to recover his breath and, aside from the loss of flesh and strength, he does not regard himself as ill. The most careful search usually fails to disclose any cause for these general symptoms.

Less frequently, but sufficiently often to be noted, distrubances of the heart, such as palpitations and arythmias, occur. The heart beats are usually regular, but suddenly two or three



Upper left, papilloma (high power); middle left, struma proliferans (high power); lower left, carcinoma.



Upper left, papilloma (low power); middle left, struma proliferans (low power); lower left, carcinoma; upper right, parastruma; middle right, struma proliferans (low power); lower right, post-bronchial goitre.

precipitated heart beats come in intermittent fashion. Symptoms simulating angina pectoris are observed. There is no fever, but there may be peculiar disturbances of the nervous system with vertigo, temporary loss of vision, and a perturbed mentality.

In all of the patients lesions of the peripheral nerves are manifested by neuralgic pains, variable in degree, character, and location. There are occipital pains, lumbago, pains like acute pneumonia, and bilaterial neuralgias of the neck and shoulders, the pains radiating from the thyroid. In some of Gruic's patients these troubles persisted until death, while in most of them they disappeared without treatment.

At a more advanced stage cachexia becomes established, which properly is only a more marked degree of loss of flesh and weight. Pallor is marked; the mucous membranes are off color; the complexion is subicteric, but the eyes do not become yellow. Hemorrhage is not noted except through generalizations established in vital organs, such as the lungs or kidneys. Edema of the extremities is an invariable and early symptom. Some patients suffer dysphagia, and experience great thrist, but special features are lacking. There is no leukocytosis.

Local symptoms are often masked by these general manifestations. When goitre existed, the clinicians usually sought to find there the cause for the persistent dyspnea. Gruic has seen the symptoms without being able to detect any outward sign of change in the thyroid gland. In most of the cases a swelling of the gland had become apparent in less than eighteen months. The most important fact noted was the increasing hardness of one or more nodes embedded in the softer parenchyma of the gland. Nootnagel[21] reports the removal of a bilateral cystic goiter in a man nineteen years of age. The frozen section of a single hard nodule he had noted in the left lobe revealed malignancy enclosed in a heavy capsule. There had been no symptoms other than a large cystic goiter.

This type of malignancy in the thyroid gland is well described by Bertrand and Carrel Billard. It means both carcinoma and sarcoma. It is relatively frequent in occurrence, presents a terrible gravity, and kills its victims with extraordinary rapidity. It appears to develop with preference in subjects of from thirty to fifty years of age, and develops either in an old goiter or in patients who had shown no lesion of the thyroid up to that time.

The tumor grows brusquely and becomes painful. In a few days or weeks it doubles or triples in volume, and diffuses itself over the whole base of the neck. It feels like an indurated plaster, or like an enormous hard and irregular mass. Radiating pains appear in the following locations in the order of their frequency: the mastoid, the neck, the face, the shoulder, and the arms.

Respiratory disturbances come on early and, gradually increasing, soon reach great intensity. At night dorsal decubitus is maintained with great difficulty; the patient sleeps sitting up by preference. His sleep is agitated and often he is awakened brusquely with the sensation of smothering, the prelude to actual suffocation.

Regarding deglutition, the patient notices first that he cannot with ease swallow a bolus of food, so he begins to masticate it well and wash it down with some liquid. This symptom is due at first to a spasm, but later on actual impediments are established. The voice at first deepens, grows rough, and is lost on exertion; later on complete paralysis supervenes. The tumor is absolutely immovable. It may break down and suppurate. Very large veins are seen on the neck, over the upper chest, and on the arms.

There is dullness over the anterior mediastinum. Large glandular swellings are present, and thrombosed veins on neck and arms can be palpated. There are metastases in the skull, sternum, or in the lungs with hemorrhagic pleurisies. The skin is reddened and adherent; signs of perforation of the trachea or esophagus may be noted; the patients cough blood and cannot swallow food. Kocher points out that the esophagus and trachea are usually damaged in their musculature only, their immobility being caused by infiltrated tissue which results in distortion on account of the pressing growth.

The general symptoms are rapid loss of flesh and strength. Cachexia, fever and glycosuria may keep pace with the regional troubles, or even overshadow them, and the patient may die from general intoxication before the local process has time to run its course. Symptoms of Graves' disease are not uncommon and are seen as tremor, tachycardia, exophthalmos, and rapid loss of strength. This clinical picture is of interest, but it has no practical value as the disease runs a rapid, fatal course.

An individual of perhaps fifty years of age with an old goiter notices that his goiter, which had been stationary for a long time, begins to expand. He feels some radiation of pain into his head or neck, but often this early stage of cancer evolution is painless. The patient may not grow uneasy, or he may resort to some sort of medication while the affection pursues its course. A case in point is that of a woman who presented herself to an assistant in service at the clinic of Berne one day with a large, one-sided goiter. The only other feature was that the sternum was prominent and seemed to have a tumor on it. It was promptly disregarded and a diagnosis of colloid goiter was recorded.

but had later to be revised by the professor to read: "Sarcoma." Such examples Kocher used with great care to give his pupils lasting lessons.

These tumors present the aspect of an ordinary goiter, and are often accompanied by some respiratory troubles. In the absence of a goiter the disease manifests itself somewhat differently. In the thyroid region there appears a small tumor which at first grows quite slowly, then faster. At the beginning there exist no signs other than the age of the patient, the growth of the tumor, some pains, and a light dyspnea; yet these signs are sufficient for diagnosis if one considers the frequency of cancer and the rarity of goiters in the old.

It is important to grasp this first period as it constitutes the manageable zone of malignant goiter. The pathology is localized entirely within the gland, and generalization at this stage is very exceptional. The apparent benignity keeps the patient from consulting a surgeon. They come when they cannot breathe any more, or when the tumor becomes menacingly large.

The intraglandular zone among most patients was observed by Poncet to be from two to six months, but it may last for two years and surgical intervention still be possible. This apparent discrepancy may be accounted for in the particular variety of the neoplasm and in its degree of malignancy.

When the stage of regional invasion is reached things change; the tumor becomes voluminous, knobby, harder; the patient is thin and pale, and is out of breath on the least effort. Laryngoscopy discloses the compression of the laryngeal nerves; the voice becomes hoarse, and is slowly lost. Respiration is increasingly difficult; a barking cough is often present and, as in acute cancer cases, paroxysmal choking spells make life miserable for the patient. The face and neck are congested, and desperate efforts are made to get breath.

The only diagnosis that counts for the benefit of the patient is the early one, and the prerequisite is the attitude of the physician. When any sort of nodule is encountered in the breast, the first question is not: "What is it?" but we ask: "Why is it not cancer?" Crotti says that the physician should be a cancer maniac. He says further that the satisfied and dangerous optimism which is too often met with finds its excuse in ignorance, and should be discarded and replaced by an alarming pessimism. In that state of mind the physician will catch the significance of any slight physical change in the tumor, and the meaning of any otherwise apparently insignificant symptom. Too often, indeed, these little prodromic symptoms are disregarded, yet they exist! It is for the physician to train his senses to perceive them, interpret them, and utilize them for early diagnosis.

Kocher stated in 1907 that of 500 patients with simple goiter, Graves' disease, and malignant thyroid, combined, he lost only three. This would indicate that the intracapsular and early period of thyrocarcinosis has a favorable prognosis. Kocher says: "Suspicion of malignancy is a categorical indication for operation." Suspicion should be aroused by two signs which may be considered constant: first, the increasing growth, which varies in different patients. Some speak of it as having been steady for several years, more rapid growth being of recent occurrence; in others this period is much shorter, extending back only a few months.

There are patients whose voluminous, rapidly growing tumors date back only a few weeks, so that the picture may resemble subacute inflammation. Constant and without exception is the history of an unmotivated foster growth during a relatively short time in patients of advanced age (Kocher.) At the same time, the general health is good. The patient can do his work, and enjoys a strong constitution. Only in the event of rapid growth are noted the effects of the expansion of the neoplasm, the neuralgias of the third and fourth cervical nerves, the change of voice, the increasing dyspnea, obstinate bronchitis, and increasing difficulty of deglutition.

The second sign of suspicion is the changing consistency of the tumor. The patient will note this symptom. The lump on the neck grows harder all the time. If there is present a large nodule which stands out strongly on one side only, and is circumscribed, yet growing fast (Kocher), is growing harder and still remains quite movable in the course of several months, or even from one to two years, there is reason to diagnose not only malignancy, but even the special form of proliferating goiter, still in the intracapsular zone of evolution.

Large thyroid arteries and dilated veins will confirm the opinion. The light difficulties of respiration and deglutition, the radiating neuralgias of the occiput, ear, and neck are considered as resulting from adhesions (Kocher). The organs cannot get away from the pressure of the neoplasm.

The signs of compression and infiltration denote serious damage,—actual paresis of vocal cords, lesions of the vagus and phrenic nerves, occlusions of blood vessels, changes of trachea and esophagus. With these extracapsular growth is proved.

The variations of character, number, and time of appearance of all these symptoms may lead to the diagnosis of special tumors. The small, slowly growing papilloma has early invaded the glands of the neck, yet symptoms are absent. The parastruma, owing to its intimate connection with the trachea and its downward direc-

tion of growth, causes early involvement of the trachea and esophageal wall and paresis of the recurrent nerve, but the neuralgias are absent; so we find that hoarseness is present and there is difficulty of breathing and swallowing, but no pain.

In the large benign intrathoracic goiters respiration is intensely interfered with. Deglutition suffers in benign goiters only when it is located between the esophagus and trachea. To differentiate sarcoma from carcinoma has not seemed of importance considering the purpose of this paper. Sarcoma grows faster and larger, is softer and not nodular. Hemorrhage in a cystic goiter effects a rapid increase in volume and increased density, which may convey the impression of malignancy. A few days will tell the tale.

Thyroiditis occurs in young individuals and is preceded and accompanied by other signs of acute infection. In the wooden thyroiditis of Riedel[22] signs of compression arise rapidly. It appears in young people, and subsides in one or two months.

Chronic thyroiditis and cancer both infiltrate the neighboring tissue, but the thyroiditis is painless and does not react on the general system.

Tuberculosis and syphilis of the thyroid are very rare, though cheesy nodules may mislead.

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RECENT ADVANCE IN THE DIAGNOSIS OF SURGICAL LESIONS OF THE KIDNEY*

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Recent advance in methods of diagnosis of surgical conditions of the kidney has been largely in the field of roentgenography and renal functional tests. Roentgenography of the urinary tract rendered opaque to the x-ray by injected mediums is now recognized as an indispensable factor in the diagnosis of surgical renal lesions. Its development was retarded during several years by the use of opaque mediums which caused injury to the injected kidney, namely, the salts of colloidal silver. This was largely overcome by the use of thorium as suggested by Burns. The occasional toxicity and the difficulty of preparation of this solution, however, prevented it from being an ideal medium. Although sodium iodid, as suggested by Cameron, obviated these objections, it remained for Weld to discover that ordinary sodium bromid has all the requisites of the ideal medium, since it is thoroughly soluble, non irritating, nontoxic, easily prepared, and inexpensive. As a result, by using this inert medium, pyelography may be employed almost routinely with cystoscopy. There is scarcely a lesion in the urinary tract in which it has not proved of distinct diagnostic value. Since the interpretation of the pyelogram has been quite fully described in recent literature I shall not go into detail concerning the various deformities of the pelvic outline.

With the improvement and standardization of x-ray apparatus as well as operative technic, roentgenographic examination of the urinary tract has become so wide-spread that there are now but few surgeons who do not have access to this invaluable diagnostic aid. In the diagnosis of renal lithiasis much progress has been made in the interpretation of the numerous confusing shadows which appear in the roentgenograms of the urinary tract. Although many of these shadows may be identified by their contour, character, and position, a large number are im-

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possible to interpret without the combined aid of clinical, laboratory, and cystoscopic data. The greatest accuracy, however, can be obtained only through the combined use of the cystoscope and roentgenographic technic, as employed in pyelography. The pyelographic data that will enable us to determine whether a doubtful shadow is extrarenal or intrarenal are as follows: (1) The distance separating the shadow from, (2) the exact relation of the shadow to, and (3) the presence of pathologic changes in the pelvic outline.

Shadows appearing in the area of the urinary tract which most frequently are responsible for error in interpretation are those caused by calcareous deposit in the extra-urinary tissue, gallstones, and tuberculous renal caseation. Such shadows may lead either to needless exploration of the urinary tract, or they may be erroneously regarded as extra-urinary.

It is well known that a gallstone is, as a rule, not visible in the roentgenogram. Nevertheless, as a result of the improvement in roentgenographic technic it is being found with such frequency as to warrant its consideration in the interpretation of every shadow in the right upper abdominal quadrant. The similarity of subjective symptomatology which not infrequently occurs between renal stone and gallstone may render the clinical data of little aid in interpreting such shadows. While the character of the gallstone shadow is distinctive and often is easily recognized, error in interpretation is easily possible. The greatest problem in the x-ray diagnosis of gallstone is to distinguish its shadow from that of renal stone. If the gallstone shadow is situated in the usual position of the kidney, and, should there be a coincidental infection of the urinary tract, the diagnosis may be exceedingly difficult. On the other hand, a renal stone may not infrequently be seen lying well above the twelfth or even the eleventh rib, in the usual gallbladder area. Furthermore, the renal stone may assume characteristics very similar to those of the gallstone. In short, the shadow in the roentgenogram cast by a gallstone and by a renal stone may be identical in position and character. The pyelogram is usually the best and frequently the only method by which the gallstone may be identified. The same data previously named in the identification of the extrarenal shadow are applicable in the differentiation of gallstones and renal stones.

Renal Tuberculosis

Recent literature has emphasized the importance of recognizing shadows caused by calcified areas in a tuberculous kidney. Although they can frequently be identified by their characteristic shadow, the combined clinical and cystoscopic data may be necessary for their recognition. The shadows are of three types, namely (1) small scattered areas caused by lime deposit in the calices, (2) larger shadows of irregular density, some of which may assume the characteristics of renal stone, and (3) casts of a portion or even the entire caseated kidney. It is advisable, therefore, to have a complete roentgenographic examination of the urinary tract in every patient suspected of having renal tuberculosis.

Shadow Localization

It is of value to the surgeon to ascertain as accurately as possible prior to operation the exact location of the stone. Approximate localization of the stone shadow in the original roentgenogram is frequently possible, particularly if the outline of the kidney is distinct. By outlining the renal pelvis in a pyelogram and then comparing the position of the stone shadow with that of the pelvic outline, the stone can be localized more accurately than in the ordinary roentgenogram. The main problem in the localization of the stone is to determine whether it is situated in the true pelvis, in a calyx, or in the cortex.

Although the percentage of error in operations for lithiasis has been greatly reduced, several difficulties still remain to be overcome. The following are the complications which are most frequently encountered at the operating table:

1. Impossibility of an exact interpretation of the roentgenogram.
2. The difficulty of locating the stone in the kidney.
3. Inability to find the stone.
4. The possibility of overlooking one or more stones when multiple stones are present.
5. The possibility of having fragments of stones broken off or loosely connected with the original stone.

Nothing is more disconcerting than the in-

ability to find a stone in the kidney when the various methods of clinical examination have definitely shown it to be there. The kidney usually becomes so congested when brought into the field of operation that searching for a small stone may be exceedingly difficult and often fruitless. Moreover, it may be difficult to determine from the roentgenogram the exact number of stones in a kidney. The shadow may appear to be single when in reality it represents two stones which either overlap or are closely approximated. What appears to be a single branched stone may be made up of several distinct stones. Again, on the removal of a branched or irregular stone, fragments are easily broken off and it may be impossible to locate them. At the Mayo Clinic we have recently made fluoroscopic examinations of the kidney at the operating table, employing small portable x-ray machines which are used by the United States Army. By this method we believe that many of the difficulties accompanying renal lithotomy will be overcome.

Renal Functional Tests

Although the indications for surgical therapy of the urinary tract are usually determined by the clinical, roentgenographic, and cystoscopic data, in many cases renal functional tests may be of considerable diagnostic value, and may largely influence surgical judgment. Tests of renal function are divided into two general types, excretory and retentive. The excretory test is the simpler of the two and is possibly the more valuable. Of the various excretory tests, the use of phenolsulphonephthalein has proved to be the most practical because of the accuracy of its elimination and ease of its administration. The original contentions of the authors, Rowntree and Geraghty, concerning the application of this test, have in the main proved to be correct. In the diagnosis of surgical conditions of the kidney it is used in estimating the renal function of both kidneys as in the combined test, and in the estimation of the secretion from the individual kidney as in the differential test.

Combined Phenolsulphonephthalein Test

The phenolsulphonephthalein test as universally employed consists of the estimation of the dye secreted by both kidneys during two hours following its appearance in the urine after intramuscular injection of 1 c.c. of phenolsulphonephthalein. Its value in certain conditions is unquestionable, but attention should be called to the fact that errors may arise which, unless carefully watched, will largely negate its value. Such errors are of two types, technical and interpretative. If either of these errors occurs, the test is not only worthless, but may even be misleading.

Technical Errors

When the test is employed in a hospital where every step can be carefully guarded and the patient kept under observation during the time of secretion so that the specimen can be completely obtained, the possibility of technical error is not great. However, as generally employed in the dispensary, ambulatorium, office, or at the bedside, the possibility of error is considerable. In our experience errors as follows have been found to occur most frequently:

1. Excessive or insufficient amount of phenolsulphonephthalein placed in the syringe for injection.
2. The loss of a portion of the phenolsulphonephthalein solution from the syringe or needle when it is injected.
3. Abbreviation or extension of the two-hour period of collection on the part of the patient.
4. Loss of part of the urine collected in transferring it into the receptacle from which the estimate is to be made.
5. Retention in the bladder of a portion of the urine secreated either because of a pathologic condition or misunderstanding on the part of the patient.
6. Error in laboratory technic, such as insufficient alkalization, inefficient interpretation of color values, and so forth.
7. Clerical errors.

Because of the many possible sources of error it is evident that a single phenolsulphonephthalein test with less than the normal amount of secretion must be considered worthless unless checked up by a second test.

Errors of Interpretation

Without placing an arbitrary figure which would govern in every case, as a general rule, a patient having a function of less than 30 per cent should be observed very carefully before advising operation. The possibility of retained urine at the time of the test from an overlooked

prostate, diverticulum, sacculated ureter, or hydronephrosis must always be considered. However, even though the phenolsulphonephthalein secretion is lower than 30 per cent, it should not necessarily contraindicate operation. It must be remembered that any renal functional test gives an index of renal activity at the time of examination but not what the kidneys are capable of when pathologic conditions have been corrected. This is particularly true in the presence of lithiasis; the reflex irritation from a stone may lower the function of one or both kidneys to an alarming degree. When, however, the cause has been removed it is not unusual to observe the renal function return to normal.

The assurance derived from a normal combined phenolsulphonephthalein test, when one kidney is definitely proved to be destroyed, is of great value. On the other hand, when the x-ray or clinical examination indicates that one kidney is diseased, it can not be inferred from a normal combined phenolsulphonephthalein test that the other kidney is present and normal. As an illustration; when a limited pathologic lesion such as a small stone, hydronephrosis, or even a limited area of tuberculosis is present in a single or solitary kidney, the combined phenolsulphonephthalein test may be quite normal. If it is inferred from this that another kidney is present the results at operation may be disastrous. The possibility of bilateral disease existing in the presence of a normal phenolsulphonephthalein secretion cannot be excluded since it has been repeatedly noted with bilateral tuberculosis, bilateral renal lithiasis, polycystic kidney, and so forth.

Differential Functional Test

A differential functional test is the method of estimation of phenolsulphonephthalein secretion collected from the individual kidneys by means of the ureteral catheter during a period of from fifteen to thirty minutes following intravenous injection. Primarily the test was used to determine the state of efficiency of the supposedly well kidney. It is, however, of even greater value as an aid to diagnosis of renal lesion. As with the combined test, the possibilities of error in technic and interpretation must be considered. It is necessary that the dye be injected intravenously and not intramuscularly, otherwise the rate of secretion will be greatly retarded. If given intravenously the dye will appear in the urine within four or five minutes after injection, and an average of 15 and 30 per cent is secreted from each normal kidney in fifteen and thirty minutes respectively. The amount of dye, however, it not always constant and may be influenced by hypersecretion in a nervous person, which will cause a much larger amount of dye to be secreted, or by hyposecretion, which may be caused by reflex inhibition of secretion from catheter irritation. Another source of error may arise unless due allowance is made for return flow of the urine alongside the ureteral catheter into the bladder. It is necessary carefully to estimate the amount of dye which is found in the bladder at the end of the fifteen or thirty minute period*. A recent suggestion of one of my associates (Peterson) has proved to be of practical value in this complication. He suggested a so-called "concentration test" which consists of estimating the dye in from 2 c.c. to 5 c.c. of the urine collected from each kidney and making a relative comparison. If the same amount of dye is found in both sides, even though a large amount of return flow urine is in the bladder, we may infer that both kidneys are functionating equally.

The value of methylene blue and indigo-carmin as an aid to ascertaining renal function must, however, also be recognized. As a rough test, particularly when one or both kidneys cannot be catheterized or when it seems inadvisable to do so, it may be invaluable. Thomas has recently added to the value of the blue test by his method of making a quantitative estimate of the dye secreted. It is, however, not of such diagnostic value, nor is it so accurate in ascertaining the degree of renal function as the phenolsulphonephthalein test. It may occasionally be desirable to employ both tests simultaneously. Peterson has shown that the blue color need not interfere with the phenolsulphonephthalein estimate. He overcomes this difficulty by simply alkalizing the urine which removes the blue color and permits an accurate phenolsulphonephthalein estimate.

*When more than 10 per cent of the total dye secreted is found in the return flow the value of the test is greatly diminished and may even be completely destroyed.

Retention Tests

Estimation of the degree of retention in the blood of metabolic end products such as uric acid, urea, and creatinin has of recent years been placed on a practical basis. This is largely the result of the work of American investigators such as Folin and Denis, Marshall, Myers and Fine, and others. The estimation of the urea nitrogen content of the blood has been most widely employed in surgical conditions of the urinary tract. It is generally recognized that an estimation of 40 mg. of urea nitrogen for each 100 c.c. of blood would indicate a guarded prognosis, and when it reaches more than 100 mg. the prognosis is very grave. More recently it has been found that creatinin when retained in the blood in amounts of more than 2.5 mg. is indicative of renal disease, and when more than 5 mg. are retained the termination is usually fatal.

Retention tests are best employed in conjunction with the elimination tests. They are of considerable routine value in checking the results of the elimination tests and calling attention to possible technical errors in their estimation. Because of inability to obtain complete data of secretion, retention tests may offer the only method with which renal function can be estimated.

Bacteriology

Probably the most important recent contribution to the bacteriology of the kidney is that made by Cabot and Crabtree, who have demonstrated that the clinical course of an infectious renal lesion is largely dependent on the identity of the bacteria. The colon group of bacilli tends to produce non-suppurative renal changes, while the pathogenic bacteria, notably the cocci, tend to produce suppurative nephritis and abscesses. Lesions caused by the colon group are usually non-surgical and, in the early stages, are amenable to treatment, whereas a coccus infection of the kidney is distinctly a surgical condition. The coccus infections usually predominate in the cortex. The importance of making a bacterial investigation of the urine in cases of acute renal infections is self-evident.

The subject of renal infection, particularly as to the path of transmission of the original infection, has in recent years engaged the attention of numerous observers. Sweet, Eisendrath, and others have performed experiments which would go to prove the existence of an ascending or lymphatic route, while Cabot and Crabtree maintain that the infection is always hematogenous. It is probable that both methods of infection may exist although the latter is by far the more frequent. However, all observers are now quite convinced that renal infection is secondary to some other active focus of infection and that it is of primary importance to exclude the possibility of such a focus in the tonsils, teeth, prostate, seminal vesicles, and so forth.

Our knowledge concerning certain phases of renal physiology has recently been considerably augmented. The use of colloidal silver in the renal pelvis demonstrated to us the absorptive power of the renal parenchyma from the pelvis. This has been experimentally corroborated by Burns, and by Weld. It has been demonstrated that phenolsulphonephthalein injected into the renal pelvis is secreted from the other kidney within five minutes. This fact has been taken advantage of in the treatment of pyelonephritis by injecting large amounts of solutions of silver nitrate and other antiseptics into the renal pelvis. It may be inferred that not alone the pelvis will be affected, but the antiseptic solution will enter the renal tubules and come in contact with diseased areas in the parenchyma itself.

Theories as to the probable etiology of symptomless unilateral renal hematuria, or the so-called essential hematuria, have recently been modified. It was formerly thought that this condition was due to a true nephritis or Bright's Type 1 (according to the classification of nephritis by W. J. Mayo.) Recently, however, the condition has been regarded as frequently the result of an insidious chronic infection of the renal papillae. Payne and MacNider, and Buerger have demonstrated that sections of the renal papillae show evidence of infections changes together with varicose condition of the venous capillaries. It would seem that the circulatory changes in the papillae are the direct result of the infection. This theory is further corroborated by the fact that permanent cessation of hematuria may be brought about by means of injecting strong solutions of

silver nitrate into the renal pelvis. The diagnosis of this interesting condition is rendered fairly exact by demonstrating the outline of a normal pelvis in the roentgenogram and by demonstrating an equilateral normal phenolsulphonephthlein output.

Cystoscopic Technic

The use of the cystoscope has, like the use of the roentgenograph, been widely extended in recent years. Many improvements have been made in the various instruments employed so that its value in diagnosis and treatment of diseases of the urinary tract has been greatly augmented. In the diagnosis of stones in the ureter the wax-tipped catheter which was suggested by Kelly many years ago, and which later fell into disuse, has recently enjoyed a renaissance. The method is as follows: Melted beeswax is placed on a ureteral catheter which is introduced up to or past a ureteral stone. If scratch marks result they should be of considerable diagnostic value. Its practical application, however, particularly with the type of cystoscopes now in vogue, has not proved so satisfactory as it might seem. It often happens, particularly with small stones, that either no scratch appears or it is too indefinite for exact interpretation. Furthermore, scratches caused by the cystoscope may be difficult to identify. On the other hand, the wax catheter, if properly employed, should give data of considerable value.

Hunner has called our attention to the existence of wide strictures or infiltrations of the ureteral wall which have been overlooked in the past. He makes his diagnosis entirely from the obstruction or rather the hang encountered by a large wax bulb as it is passed through the strictured area. The frequency with which such a stricture occurs and the variety of symptoms it causes will make this condition one of primary importance if the findings of Hunner are corroborated by future investigation. The scarcity of pathologic and anatomic confirmation, however, in a measure negates the value of this contribution. Hunner furthermore claims that stones found in the ureter are usually formed in the dilated portion above a stricture rather than primarily in the kidney. Although the suggestion is of considerable interest it, nevertheless, lacks confirmation and seems improbable because of the following reasons: (1) The presence of a strictured area in the ureter below a stone has not been corroborated by other surgeons. (2) Ureteral catheterization following operation fails to demonstrate strictures. (3) The small percentage of ureteral stones that recur even though no attempts are made to treat a stricture.

In conclusion I would say that recent progress in diagnosis of surgical conditions involving the kidney has indeed been considerable. The interest in the subject by both internist and surgeon is widespread since the close relationship of renal diagnosis to that of the surrounding organs is realized by both. Today there are but few medical groups that do not have access to such methods of diagnosis as I have described.

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LETHARGIC ENCEPHALITIS (WITH REPORT OF TWELVE CASES)

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In reviewing the literature, one is impressed with the fact that epidemics of Lethartic Encephalitis and similar symptom complexes have almost invariably been associated with an epidemic of Influenza.

In 1712, Camerarius described sleeping sickness following an epidemic of Grippe. A similar condition occurred in Germany in 1745, in Lyons in 1800 and in Milan in 1802. The south and west portions of Europe were afflicted with a pandemic in 1889-90, followed by a disease at that time known as "Nona," characterized by lethargy and cranial nerve palsies. According to Mauthner, the pathologic lesions found were those of an acute hemorrhagic polioencephalitis. It is of interest to note that during the influenza epidemic in this country occurring at the same time, very little mention is made of any complications of encephalitis. No further epidemics are recorded in the literature until 1917, when a similar disease again devloped in Austria and was fully described by Economo who suggested the term Lethargic Encephalitis. Early in 1918, France and England reported cases with the same symptomatology. Soon after the disease began to manifest itself in this country and at a meeting of the New York Neurological Society in February, 1919, it was recommended at the suggestion of Abrahamson to make this disease a reportable one, because it was becoming so prevalent in that city. Numerous cases have been reported in Chicago by Bassoe and others, and from personal information obtained this condition is occurring more frequently in our own community although in no alarming degree; about 30 cases have been observed in the Twin Cities during the past four months.

The symptomatology varies considerably depending on the localization of the pathological process and the virulence of the causative factor. The onset is frequently acute there may be prodromel symptoms such as general malaise and coryza; occasionally it opens in a fulminant fashion. Lethargy, asthenia, general although mild muscle rigidity and mask-like features have been the most frequent general symptoms in our group of cases. Regardless of the degree of stupor, it is surprising how readily the patient can be aroused, how accurate his responses are, and how promptly, although sluggishly, he will execute a command. The gait, posture and facial expression are often quite typical of paralysis agitans without the tremor. Mental symptoms may occur. Wilson described a case which showed typical "Witzelsuch" through the entire course of the illness. Delusions and hallucinations may be present. Temporary disorientation and confusion are not infrequent. In one of Dr. Riggs' patients, whom I had an opportunity to study, a hypomania alternating with mild depression was observed. One case was referred to me with a diagnosis of the catatonic type of Dementia Praecox. A quite typical picture of a Korsakoff's psychosis was noted in another one of my cases. Headache occurs early during the disease. Loss of bladder control—either involuntary urination or retention, is not infrequent. Symptoms of meningeal irritation such as Kernig's sign and rigid neck are occasionally present although mild. The temperature is very irregular one of our patients ran a normal course throughout, while another one had a temperature around 102°F. for four weeks.

*Read before the Southern Minnesota Medical Society, Dec. 2nd, 1919.

Of the localizing symptoms, the cranial nerves are most frequently involved, especially the oculomotor. The pupils may be dilated or contracted. Loss of the light and accommodation reflex is not uncommon. The patient frequently complains of diplopia. Bilateral ptosis may occur but is often simulated because of the lethargy. The features are expressionless either due to a bilateral involvement of the facial nerves or as a part of the general muscle rigidity. The tongue frequently cannot be protruded beyond the lips. If the palate and pharyngeal muscles are implicated, this is usually of a transient character. The deep reflexes may be normal, increased or absent. Occasionally, one finds a Babinski. Sensory disturbances are infrequent; choreiform movements, tremors, muscular twitchings, paralysis and convulsions rarely occur.

Bassoe attributes the retention of urine and the difficulty in speech and swallowing in most cases to an involvement of the tonus controlling extrapyramidal motor apparatus, which also explains the general rigidity. According to recent investigations, this controlling mechanism is located in the basal ganglia which region is a favorite site for the inflammatory changes of lethargic encephalitis.

Blood examination has been normal throughout except for a mild leucocytosis. All spinal fluid tests have been negative except for an increase of globulin and a moderate pleocytosis, mostly lymphocytes. These practically negative blood and spinal fluid findings accompanying so profound a picture of acute central nervous involvement are quite an important point in the differential diagnosis of lethargic encephalitis.

The duration of the disease may vary from a few days to weeks and months. Recovered cases frequently manifest definite organic symptoms over a long period, such as sluggish pupils, diplopia, a Parkinson's gait and deep reflex changes. Reports regarding the mortality rate have varied considerably. Six out of eleven of Economo's died seven out of fifteen of Netters', two out of thirteen of Wilson's and six out of our own series of twelve cases.

Bacteriological examination of the blood and spinal fluid have been uniformly negative; all ordinary and anaerobic cultures have proved sterile. No recognizable organisms have been detected in the tissues on microscopical examination. However, attention must be directed to two observers who reported definite findings. Von Wiesner injected into a monkey subdurally an emulsion of the brain and spinal cord from one of Economo's patients. The animal died within 46 hours, having manifested symptoms of stupor with paresis of the right hind leg. The monkey's brain showed all the characteristics of an acute hemorrhagic encephalitis, and Von Wiesner was able to culture a gram positive diplostreptococcus from the same. His findings call for further confirmation as his conclusions semed rather unsatisfactory.

Strauss, Hirshfield and Loewe successfully inoculated monkeys with an emulsion of the human brain and produced the characteristic lesions found in Lethargic Encephalitis. They were unable, however, to culture or demonstrate any bacteria. In a later report, they state that a Gram positive organism had been isolated and cultured through twelve generations and that it resmbled those described by Flexner and Noguchi in poliomyelitis.

SPINAL FLUID FINDINGS

Case No.	Day after Onset	Pressure	Globulin	Cell count	Fehlings	Wassermann	Colloidal Gold
1	10	N	trace	27	N	0	Not made
2	7	N	0	6	N	0	Not made
3		No spinal fluid examination made.					
4–	6	Increased	++	18	N	0	0001231000
5–	15	"	trace	15	N	0	2334300000
6–	18	N	0	9	N	0	0000000000
7–	28	Increased	++	12	N	0	1212100000
8–	30	"	trace	3	N	0	Not made
9–	3	"	++	38	N	0	0111221200
10–	6	"	trace	8	N	0	0110000000
11–	12	"	++	54	N	0	0122210000
12–	10	N	0	6	N	0	Not made

Our present series of Lethargic Encephalitis comprises twelve cases, ten of which occurred in Minnesota during the last four months and the other two I had an opportunity to observe while with Base Hospital Number 99 in France.

The first case is of interest because of the very mild course, the typical Parkinson gait and the possibility of a brain abscess.

Case No. 4. Female; age 28, seen in consultation with Dr. J. Staley October 20th, 1919. Her family and personal history were negative except that she had scarlet fever as a youngster complicated by a right chronic otitis media. Passed through a mild attack of Influenza in De-

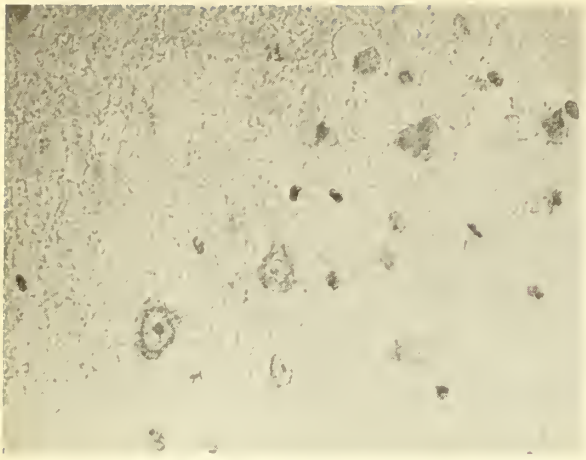

Fig. 1. In the region of the 3rd nucleus, showing chromatolysis.

cember, 1918. About October 1st, 1919, patient noticed that her discharging ear "had stopped running" and was somewhat tender. Two weeks later she complained of vertigo and drowsiness. Soon after, she developed diplopea and a choking sensation on swallowing. She went to bed and slept continuously for three days. She "felt stiff and rigid" all over and had an expressionless face. On October 16th, her ear began to discharge again and she noticed an improvement. Examination was made October 20th, 1919. Patient was lying on the couch, but had ben up and around part of the time. She had a typical paralysis agitans gait and posture without the tremor. Her right pupil was slightly larger than the left. They both were sluggish to light and accommodation: the backgrounds were negative. Her face was mask-like, but she could move her facial muscles. Her eye movements were normal except that there was a slight constant irregular nystagmus-like movement of both eyeballs. She protruded her tongue with difficulty. Her upper extremities were negative except for a mild rigidity. Her lower extremities were rigid, had absent knee-jerks, the Achilles jerks were present; there was a bilateral ankle-clonus, but no Babinski. Superficial reflexes were normal; her bladder functions were normal; there was no Romberg, no Kernig and no rigid neck; the temperature and pulse were normal throughout. Spinal fluid examination on October 20th showed the following: Increased pressure, a trace of globulin, 16 lymphocytes per cu. mm., a negative Wasserman and a negative Colloidal Gold curve; the urine was negative. Patient improved decidedly after lumbar puncture and in three weeks had entirely recovered.

The second case was of unusual severity and manifested spinal cord involvement.

Case No. 8. Male: Age 24; seen in consultation with Dr. Brimhall October 22nd, 1919. Family and personal history negative except that patient had a mild attack of Influenza in January, 1919. Present trouble commenced September 16th, 1919, with severe frontal headache lasting about ten days, after which patient went to bed. This headache was entirely relieved by the use of an ice-bag. On September 28th, he became stuporous and gradually developed general muscular rigidity. He could be aroused without much difficulty and would answer questions coherently. Since October 29th, he has been unable to talk, but understands, everything fully. It has been necessary to catheterize him regularly. At times he has had irregular coarse twitchings of his right arm and leg. During the past three weeks he developed an atrophy of the adductor pollicis brevis and the interossei muscles of the right hand. From September 26th to October 25th, his temperature varied between 100 and 103°F., and his pulse was around 130. Since then his temperature has gradually dropped to 99.6 and his pulse around 94. The neurological examination on October 22nd, 1919, showed the following: Patient in bed with eyes closed and motionless. Can be roused without difficulty; neck rigid and general muscle rigidity. The face is mask-like but he can move all facial muscles on command. The left eye was miotic and smaller than the right. They both respond sluggishly to light and accommodation. All eye muscle movements are normal; backgrounds negative. He protrudes his tongue to the lips after considerable urging. At times there is a slight tremor of the right side. The upper extremities were negative except for a mild general rigidity. The lower extremities showed increased bilatral knee-jerks, no ankle jerks, no Babinski, general rigidity. The laboratory examination made on October 24th showed the following: leucocytosis 14,000; blood Widal and Wassermann negative; blood culture negative; urine normal; blood pressure systolic 120; diastolic 75. Spinal fluid was under pressure, gave a mildly positive

globulin, three lymphocytes per cu. mm., a negative Wassermann, no Colloidal Gold was reported. Laboratory examination made on November 5th gave similar findings. I saw this patient again on November 21st. His picture had not changed materially except that he seemed brighter and his temperature was lower. However, he had developed some atrophy of the right hand muscles. On Jan. 18, 1920, Dr. Brimhall informed me that patient had improved, so that he was able to play cards.

Case No. 9 is a typical case with the usual symptom complex. Male: Age 21, seen in consultation with Dr. Hammes, Sr., at Hampton, Minn., November 12th, 1919. Negative family and personal history except that four members of the family had a severe attack of Influenza in February, 1919 the present patient, however, escaped. On November 6th, 1919, patient complained of severe frontal headaches and general malaise, temperature 102°F., pulse 85. He recovered entirely by November 10th, but the following day he became drowsy and stuporous, which gradually increased. The patient would lie in bed, motionless like a log, with eyes closed and mask-like face, but could be aroused easily and answer questions. Neurological examination showed the following: Left pupil larger than right; they both respond sluggishly to light and accommodation and were moderately miotic; backgrounds of eyes negative. The eye movements were normal, features were expressionless, but facial muscles could be moved normally. The tongue was protruded with difficulty and only to the lips. He moved both upper extremities in an awkward manner and they were mildly rigid. The lower extremities were similarly affected the knee-jerks were diminished, Achilles jerks normal. There was a slightly rigid neck but no Kernig. Superficial reflexes and sensation were normal. There was urinary retention and the patient had to be catheterized. Temperature 101°F., pulse 114. Spinal fluid was under pressure, gave a positive globulin, 38 lymphocytes per cu. mm., a negative Wassermann, and a Coloidal gold curve 0111221200. No blood examination was made. Urine negative; blood pressure systolic 118; diastolic 70. The patient is gradually improving. On November 27th, he had two general convulsions of short duration followed by a paralysis of his right arm. This, however, cleared up in about eight hours.

Case No. 10. Female; Age 51; seen in-consultation with Dr. Sanford of Farmington, November 6th, 1919. Family and personal history were negative. Patient states that during the week of October 20th, 1919, she nursed her daughter, who was supposedly suffering from Influenza. October 30th, patient developed an acute coryza, with general malaise, dizziness and severe headaches. The following day her vision became blurred and the next morning she complained of diplopia and severe pain in the left ear, which subsided in 24 hours. On November 4th, she became stuporous, but could be aroused easily and answered questions promptly, but would move her extremities awkwardly and only when urged. Otherwise, she would lie in bed with eyes closed and motionless. On November 5th, she developed irregular twitchings at the right angle of the mouth and occasionally of the right hand. Her left arm seemed ataxic and she began to have involuntary urination. Her temperature varied betwen 99 and 102 and her pulse around 100; physical examination was negative. Neurological examination showed the following: Pupils were somewhat miotic, but responded to light and accommodation; the fundi were normal; there was weakness of the right sixth and also of the right facial muscles; the face was expressionless; there was a general rigidity of all extremities; she moved her left arm in a jerky manner. All deep and superficial reflexes were normal. Tactile and pain sense were impaired over the right hand and forearm. Spinal fluid examination on November 6th showed an increased pressure, a trace of globulin, 7 lymphocytes per cu. mm., a negative Wassermann, and a negative Colloidal Gold curve her urine was negative; systolic blood pressure 140; diastolic 70. Patient progressively grew worse and died November 8th, 1919.

Case No. 5. Male; age 53; admitted October 16th, 1919, to the Neurological Service, City and County Hospital, St. Paul, gave a negative family and personal history. On October 12th, 1919, patient complained of an acute coryza, severe headache, general malaise and joint pains. He began to wander around his home in an aimless manner. The following day he became drowsy and sluggish mentally and soon after

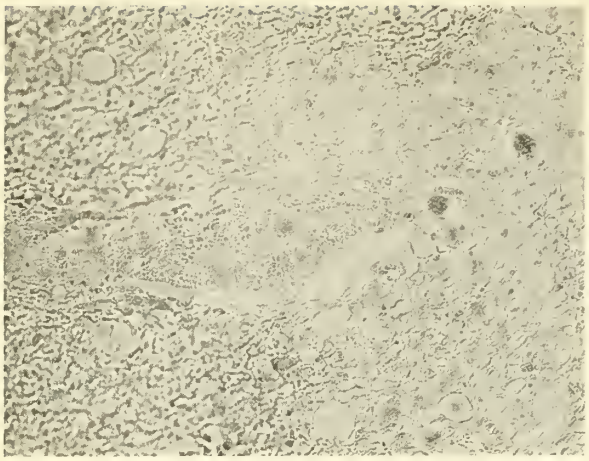

Fig. 2. Pons, showing marked round cell infiltration and edema.

became stuporous. When I first saw him six days after the onset, he was disoriented, but answered all other questions intelligently. He was lethargic but could be aroused readily. The neurological examination showed the following: Pupils were moderately dilated and did not respond to light or accommodation. There was a weakness of the right external and left internal rectus eye muscles. The fundi were negative. The face was mask-like, but he could move all facial muscles. He protruded the tongue with difficulty. The upper extremities were normal, but mildly rigid. The lower extremities showed absent knee and Achilles jerks, no Babinski, no spasticity. Leucocytosis 11850, blood culture negative, urine normal except for trace of albumin. Blood Wassermann negative. Spinal fluid gave increased pressure, a trace of globulin, 8 lymphocytes per cu. mm., a negative Wassermann and a Colloidal gold curve 2334300000. Repeated lumbar punctures gave similar spinal fluid findings. The patient progressively grew worse and died eighteen days after onset of illness. The post-mortem performed by Dr. Kramer, revealed no pathologic changes except a thickened urinary bladder wall and a chronic diffuse nephritis. Gross examination of the brain showed that its surface was slightly congested, the lateral ventricles were moderately dilated; cross-sections throughout appeared normal. There was no gross evidence of hemorrhage or softening. Microscopic findings will be reported later.

Case 6 is of interest because of the involvement of the respiratory centres early in the disease. Male: Age 45; was admitted on the Neurological service, City and County Hospital, St. Paul, October 29th, 1919. His family and personal history were negative. On October 15th, patient noticed that he felt weak, drowsy and wanted to close his eyes. He continued his work as a teamster for three days, until he went to sleep while driving his truck fell down and injured his knee. He remained at home for eleven days during which he "slept" most of the time. He also noticed difficulty in breathing at times. Patient was examined October 20th; he was in bed motionless and with eyes closed. He could be aroused easily, answered questions, got up and walked around, and presented the typical gait and posture of a paralysis agitans. Occasionally, he would have a general coarse tremor. At irregular intervals, he would get attacks of cogwheel respiration of one to two minutes' duration, during which his respiration would go up to 72 per minute. He was markedly rigid. Physical examination was negative except for an atrophy of the left calf muscles, which patient states he has had all his life. His pupils were normal. The light and accommodation reflex was sluggish and disappeared after three days. There was a paralysis of the right internal rectus. The face was mask-like, but all movements were normal. All other cranial nerves were normal. All deep reflexes were normal except for an absence of the left Achilles jerk. Blood culture was negative, Widal negative, Wassermann negative; leucocytes 12,200. Spinal fluid was under pressure; contained 10 lymphocytes per cu. mm., and a trace of globulin, but was normal otherwise. His temperature varied between 100 and 102, his pulse around 130, his respiration varied betwen normal and 72. His stupor gradually depened and he died November 9th, 1919. Postmortem examination performed by Dr. Kramer gave no gross pathologic findings. The meninges were moderately congested as was also the entire surface of the brain. Cross sections revealed no lesions. The meninges covering the spinal cord were normal, as was also the cord itself. Microscopic findings will be described later.

Case No. 11; male, age 23, was admitted on Dr. A. Hoff's medical service, City and County Hospital, St. Paul, November 16, 1919, with a

Fig. 3. Cerebellum showing capillary congestion.

diagnosis of suspected typhoid. A lethargic encephalitis was suggested and Dr. Hoff kindly permitted me to see the patient. His family and personal history were negative. About November 9th, he began to feel drowsy and weak. Soon after he had two severe attaeks of epistaxis. About November 12th, he developed marked photophobia, also a slight general musele rigidity, and he beeame stuporous. I first saw the patient on November 18th; he was drowsy but could readily be aroused and answered questions coherently. His mental eondition was normal. He would not open his eyes beeause of marked photophobia. Neurologieal examination showed the following: Pupils equal and responded to light and aceommodation. He had a paresis of the left internal reetus. All other eranial nerves were normal. All deep reflexes were normal. He had a positive right Babinski. Blood eulture was negative, Widal negative,, Wassermann negative; leucoeytosis 17000, urine normal. Spinal fluid was normal exeept for a positive globulin and 54 lymphoeytes per cu. mm. On November 19th, he seemed confused and disoriented and developed a typical mental pieture of a Korsakoff's psychosis. He died November 21st, 1919. Postmortem was performed by Dr. Kramer and gave no general gross pathologie findings. The meninges and the brain surfaee were markedly eongested and edematous; the blood vessels were engorged but there was no evidenee of hemorrhage. Cross sections revealed a generalized eongestion without any evidence of hemorrhage. A small area of softening was found in the region of the medulla. The histopathologie findings will be reported later.

While with Base Hospital 99 in France, I saw two soldiers, both of whom gave a history of an acute attack of influenza with reeovery. Several weeks later, they eomplained of headache, double vision and gradually beeame stuporous. One had a slight tremor at times, spastieity of the extremities and involuntary urination and was eonfused mentally. Temperature varied between 100 and 102°F. The stupor became more marked and the patient died after a four weeks' illness. His spinal fluid was negative exeept for a positive globulin test and 27 lymphocytes per cu. mm. The other ease ran a milder eourse, his diplopia and lethargy gradually improved, but his general musele rigidity and expressionless faee were still present, although slight, after seven weeks, when he was transferred to another hospital. His spinal fluid was normal throughout.

Preliminary report of the histopathologie findings. The histopathologie lesions in our eases were similar to those described by others in Lethargic Eneephalitis. We had an opportunity to study the brains in Cases Nos. 5 and 11 and the brain and spinal eord of Case No. 6. Although the findings in the main were very similar, the most marked ehanges were observed in Case No. 11.

The outstanding features were:

(a) Perivaseular infiltration of polymorphenuclears and lymphoeytes, the latter predominating.

(b) Pericellular gliosis.

(c) Chromatolysis and neurophagia in the brain and spinal eord especially in the mid-brain and brain stem.

(d) Dilatation of the perivascular and perieellular lymph spaces.

(e) Congestion of the eapillaries and smaller vessels in the eerebellum and other areas.

(f) Marked pigmentation of the anterior horn eells and some of the eells of the cranial nuelei.

(g) In Case 5 and 6, the meninges were practically normal, while in Case 11 there was definite evidence of an acute inflammatory involvement of the meninges, espeeially in the region of the eerebellum and the pons.

I am indebted to Dr. C. E. Nixon and Dr. J.

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THE TREATMENT OF EMPYEMA BY A CLOSED METHOD*

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Surgery of diseases of the thorax is still in a chaotic state. One has but to mention injuries to the lung and heart, malignant tumors, abscess of the lung, and bronchiectasis to recall the inefficiency of surgical treatment. The thorax has long been a "no man's land" except to the most courageous. Almost up until the present time, the lung has been the sole organ that has not been subjected to the ordinary rules of war surgery, but Duval[1] has recently stated that now, surgery of the lung is a revolution; that it is not the redoubtable organ that it was before the war, for it has been proven practical to eventrate the lung, lobe by lobe, just as one does loops of intestine—to incise, resect and replace in the thorax. The physiology of respiration, as modified by war wounds, is again being investigated and debated, the mechanism of lung collapse and the regulation of negative pressure are again new problems.

Conspicuously ineffective has been the treatment of empyema,—the most common of the surgical effections of the chest—admittedly badly handled, with its high mortality, its prolonged period of disability, and its secondary operations so frequently deforming.

In a very complete report from Mount Sinai hospital, covering a period of 10 years, Wilensky[2] gives an average mortality of 28%. In many of the army camps the mortality was from 45 to 65% while one camp reported the excessive death rate of 84%; the average for all the camps for empyema preceding the influenza epidemic was reported by the Influenza Commission[3] as 30.2%. From 10 to 25% of the patients that recover have more or less trouble with their wounds, necessitating some form of secondary operation, either a simple thorocotomy or one of the deforming operations of the Schede, Estlander or Delorme type. Mount Sinai statistics show an average stay in hospital of 44 days; Perthes Sims and Gros show an average stay in hospital of 94 days, and to these periods of illness must be added, further, long periods of convalescence before health is restored. To quote from one army camp: "Convalescence is more than 3 months in duration in all cases, and not one soldier has been found with full restoration to health; it is doubtful if any of these soldiers will become fit for full duty within six months after operation, and the majority, undoubtedly never will." Obviously, here is opportunity for betterment in the handling of empyema.

During the spring epidemic of measles and streptococcus pneumonia and the fall epidemic of influenza pneumonia, at Camp Dodge, there were 177 empyemata that were treated by the surgical service of the base hospital.

Our experience led us to make several radical changes in the management of this disease and this experience is offered as the basis for this paper. In the first place, the older and commonly accepted practice of operative interference immediately following the discovery of pus in the chest when secondary to lobar pneumonia, was found inapplicable to the empyemata of streptococcus pneumonia that prevailed in the epidemics mentioned. This change of treatment followed the development of our knowledge of the new type of pneumonia and was based upon the nature of the differences of the two conditions. In the empyema of lobar pneumonia as we were accustomed to it in civil practice, we were dealing with a post-pneumonic complication—a condition that arose after the acute illness had somewhat subsided, while in the empyema of

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the streptococcus type we were dealing with a complication which was characteristically coincident with the pneumonic process. It was no uncommon occurrence for a soldier to be admitted to the hospital for pneumonia who had at the time of admittance a massive pleural exudate. Ward surgeons were instructed to be on the lookout for fluid in the chest in every newly admitted pneumonic patient.

Early rib resection was at first routinely practiced but was attended with such disastrous results that it was soon abandoned, aspiration done and repeated as many times as necessary until the patient passed the critical period of his pneumonia and the fluid was more definitely purulant. When early rib resection was employed the patients frequently returned to their ward in shock from which they never rallied. The mortality of early rib resection in 65 cases, was 54%; when repeated aspirations with later thorocotomy, was adopted the mortality fell to 32%. Repeated aspiration with deferred thorocotomy, represented the accepted treatment at the close of the spring epidemic.

With the onset of the influenza epidemic in October, which was characterized by an intense virulence and excessive mortality, only the most conservative surgical methods were practised and an early effort made to establish the principals of a treatment for empyema that would be appropriate to the conditions. It was decided first, to try to tide the patient, seriously ill with pneumonia and empyema, over the critical period of his illness by one or more aspirations, thereby preserving for him all of his remaining respiratory function, by avoiding a pneumothorax and collapse of the lungs, thereby also avoiding the shock of an operation for drainage when he was least able to stand it; and secondly to try and maintain a constant negative pressure in the thorax in order to secure expansion of the lungs and rapid obliteration of the abscess cavity. Approximately 43 of the earliest cases, were treated by repeated aspiration and the injection of 2% formalin-glycerin. Though of distinct value, aspiration proved at best, a temporary expedient in tiding a patient over to a time of increased resistance. Not one case recovered by means of aspiration alone. Some more adequate drainage was necessary.

We then adapted with some modifications, a method which had been tried at Camp Lewis[4] of a simple inter-rib thorocotomy, under local anesthesia, with the insertion of a special tube through the chest wall, which was then sutured tightly to the tube in order to make the pleural cavity air tight. The special tube consisted of a ⅝ inch rubber tube connected with a bottle to receive the drainage, and through this larger tube ran a Carrel tube to a flask of Dakin's fluid. Constant negative pressure was attempted by connecting the drainage bottle with two other bottles serving by syphon action, to exhaust the air in the drainage bottle.

The practical application of this method soon demonstrated its inefficiency, for the tube in the chest wall would become loose, air would thereupon enter the pleural cavity and collapse of the lung follow. Drainage from the chest would occur along the tube and the danger of secondary infection result. Twenty-nine cases were thus treated,—four of which recovered and nineteen had the large tube removed and were treated by the method next to be described.

About the first week of November, we received from Lt. Col. Jos. Miller, then in the Surgeon General's office, but formerly chief of the medical service at Camp Dodge, a report of a board appointed to report to the Surgeon General, upon the merit of a closed method of treating empyema which had been developed by Capt. A. E. Mozingo, M. C. U. S. Army, at the Walter Reed Hospital. The opinion of this board was "that the results of this treatment are sufficiently striking to warrant its more extended use."

The essential points of this method[5] are;

(a) A single early minor operation, without danger of shock or of collapse of the lung.

(b) The intermittent removal of pus, and antiseptic treatment applied through a small rubber tube which fits air tight in the chest wall.

(c) Rapid partial sterilization with Dakin's solution followed by complete sterilization with 2% formalin-glycerin.

(d) Maintenance of negative pressure in the empyemic cavity tending to early obliteration of the cavity.

(e) One dressing which will last several days with no skin irritation.

Our technique[6] carrying out the above essential points was as follows: Under novocain, a 7 m.m. trocar with cannula, was introduced into the pleural cavity, a small incision in the skin having been made previously over the cavity as determined by preliminary aspiration. The trocar was withdrawn, leaving the cannula in place until a 24 F. catheter, with one terminal and two lateral openings had been introduced. Then with a 30 c.c. Luer syringe the pus was withdrawn; care being taken to avoid the entrance of air by clamping the tube when the syringe was disconnected from the tube. After the pus had been withdrawn in this manner, 20 to 50 c.c. of Dakin's solution was injected into the cavity and sucked in and out to dissolve the fibrinous masses. The cavity was then nearly filled with Dakin's solution and this allowed to remain from 10 to 30 minutes and then withdrawn. The treatment was repeated from 4 to 6 times in the 24 hours, the frequency depending upon the condition of the patient and the rapidity with which the pus accumulated. The tube remained clamped except when aspirating or injecting. All cases were controlled by laboratory count and when the discharge on smear, was free from micro organisms, which was usually from 10 to 14 days, the treatment period was extended to 12 hours, and then after each irrigation 10 to 50 c.c. of 2% formalin-glycerin was injected and left until the next treatment, when the process was repeated. When the discharge became sterile to culture and the cavity had diminished to a capacity of 15 or 20 c.c. the tube was withdrawn and the opening allowed to heal.

Beside roentgen-ray pictures were repeatedly and systematically taken of all cases, and they proved that negative pressure was maintained and that lung expansion did persist in the cases treated by the closed method; a rapid diminution in the size of the cavity in the cases which had a pneumothorax at the beginning of this treatment was also demonstrated.

Of the 43 cases treated by this method, all were cured of their empyema and none of them had to have secondary operations, save one case which, significantly happened to be the first empyema operated, and upon which an open thorocotomy had been done with no attempt made to prevent collapse of the lungs. This case was openly drained for several weeks before the closed method was tried. The cavity was successfully sterilized and closed and the patient left the hospital for her home but was reported to have had a secondary abscess opened in a posterior position.

The average time between the operation and the closing of the wound was 31 days; the shortest time being 16 days. It should be remembered, however, that 37 of our series had been repeatedly aspirated or subjected to some form of thorocotomy previous to the employment of the closed method and it is not to be expected that our results would be as good as in a series in which the closed method had been used exclusively and instituted early before the stage of thickened pus. Our mortality was 4%. In a personal communication dated September 19, 1919, Captain Mozingo writes that he has treated 129 cases by this method, at the Walter Reed and Camp Pike hospitals and that in no instance has it been necessary to reoperate for recurrence; that but two deaths occured in the series, both resulting from double empyema, one acute and one chronic. In the first 70 cases the cavities became sterile in an average of 10 days. There were no chest deformities and full chest expansion was obtained.

This simple closed thorocotomy has definite and distinct advantages and can be used with a wider range of cases, with the assurance of safety which is not promised by open thorocotomy.

The preservation of the negative pressure in the chest through treatment assures against primary collapse of the lungs and its consequent dangers.

Recently, Graham and Bell[7] have re-emphasized the dangers of primary pneumothorax occuring during pneumonia. From an experimental and clinical study, they show that from the standpoint of pressure relationship the normal thorax should be regarded as one cavity instead of two. Any change of pressure in one pleural cavity is accompanied by practically an equal change in the other so that an equilibrium of pressure exists at all times through the whole thorax. The prevalent conception of

pneumothorax is, therefore, erroneous, in that it is based upon the assumption that when an opening is made into the chest, one lung is collapsed and that the other lung maintains respiration. This assumption implies that the mediastinum constitutes a rigid partition between the two cavities, which is not the case. Much depends upon the size of the opening in chest. Whenever the amount of air taken into the lungs is limited by the presence of an active pneumonia or when there is sufficient weakening of the respiratory muscles to impair compensation, the size of the pleural opening compatible with life becomes correspondingly smaller. Therefore they insist, early operation in streptococcus pneumonia with open pneumothorax carries an unwarranted danger.

In our cases there was a noticeable difference in the aspect of the patient when operated by this simple method. The absence of pain, of shock, of dyspnoea and of respiratory embarrassment was in striking contrast to these complications attending open thorocotomy, the respirations in the latter cases sometimes going to 50 or 70 and the patient presenting the picture of acute air hunger. The closed method, also, affords a distinct advantage over open thorocotomy, by reason of the mechanical obliteration of the empyemic cavity due to constant expansion of the lung. This favors early beneficial adhesions between the pleurae and secondary pockets are thus prevented. The cause for retardation of healing of empyemata or for the failure to heal, in 50%, at least, of cases is due to an uncollapsable cavity; the rigid chest wall and the lung bound in collapse, constituting the mechanical explanation. Rapid sterilization and lung expansion combat these hindrances effectively. The closed method, moreover, insures against secondary infection which, it is well known, contributes largely to the chronicity of empyema.

Throughout treatment by the closed method, the tube remains tightly hugged by the chest wall, so effectively, that there is no soiling of dressings and the original simple dressing frequently remains on for 2 or 3 weeks. Other points of merit are: The absence of pain and tenderness which is so frequently complained of by patients with rib resection; the absence of sears; the attainment of full chest expansion. Patients under this treatment may be up and around in a few days after operation and seem to convalesce the faster for it. The simplicity of the technique, the minor character of the operation, the cleanliness and comfort of the patient, and the economy of time and dressings further recommend it as the ideal treatment for acute empyema yet devised.

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A NEW OPERATION FOR PYOTHORAX: THE TREPHINE OPERATION*

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Empyema is a grave condition. The common pneumoeoccic variety has generally made primary recoveries following nearly any type of thoraeotomy. These primary recoveries have been followed, however, in large percentages, by the secondary evil results of chronic suppurating cavities and sinuses demanding surgery of an heroic calibre. It is from these latter secondary conditions that the true mortality and morbidity rates must be calculated. Many of these cases "with just a discharging sinus" **and a cavity behind it**, after repeated operative efforts, or without the same, finally become worn out and die.

Empyema of streptococcic origin has always been attended by a certain primary mortality. The empyemata of our recent epidemic have had a shocking primary mortality both in civil and military practice. Undoubtedly this mortality was due in great degree to the large percentage of streptocoecic infections and to the character of the antecedent or complicating primary illness. However, certain fundamentals of the

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physiology of respiration and the pathology of the disease have been disregarded, which directly affected the morbidity and mortality.

The thoracic cavity is in a constant state of varying negative pressure. When the normal pleural sac is incised and left open, air enters from without, the lung in time collapses, and positive atmospheric pressure obtains, forcing the mediastinum over to the opposite side, thereby embarrassing both the respiration and the circulation. An acute open pneumothorax is a serious and major lesion, having a direct mortality even in the absence of infection, as has been attested in the recent war.

The same mechanical conditions obtain when an open thoracotomy is performed during the formative period of a streptococcic pyothorax, that is, before adhesions have formed between the pulmonary and parietal pleura, fastening the lung to the thoracic wall and so preventing its collapse and retraction. In many of these cases the shock of the hyperacute pneumothorax, with the lung collapse and the displaced, fluttering mediastinum, resulted in an early and prompt death of the patient. The ardnous and painful, repeated, aspiration was advocated to avoid the dreaded evil consequences of the pneumothorax. Pneumothorax is particularly hazardous in the presence of an unresolved pneumonia on the opposite side.

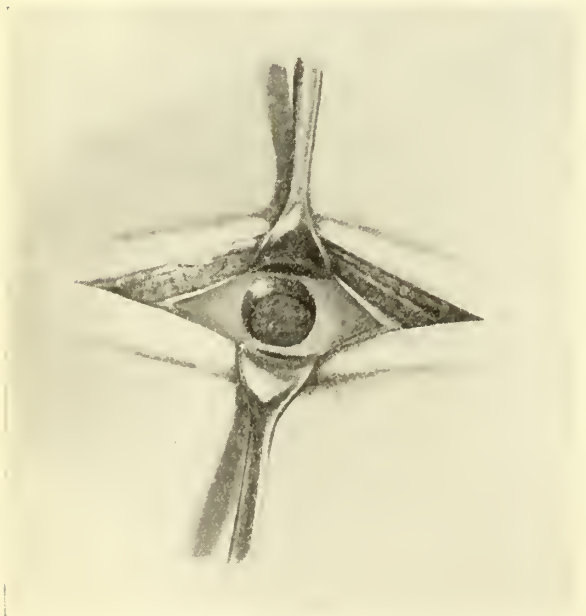


Fig. 1. The exposed rib with the periosteum over its anterior surface separated, has been trephined. The posterior periosteum and pleura at the bottom of the trephined opening are intact.

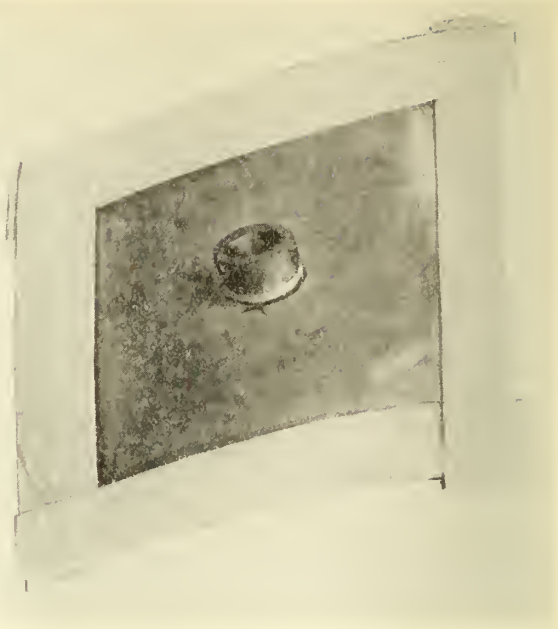


Fig. 2. The rubber drainage tube passing through the trephined opening into the empyemic cavity is shown emerging through the perforated square of rubber dam which is strapped to the chest wall with adhesive tape.

If the patient survives the immediate effect of the acute pneumothorax, the collapsed, retracted lung rapidly becomes adherent in its new location, usually high up in the thorax and close to the vertebral column. The visceral and parietal pleura becomes thickened and an enormous chronic suppurating cavity is formed, requiring multiple operations before a closure is effected. Not infrequently, surgery proves ineffectual.

Open thoracotomy in the walled off empyemata usually causes a certain degree of partial lung collapse in addition to the compression already present. As we well know, nature, surgery, or both, are frequently slow in obliterating the cavities so formed.

The primary operation for pyothorax should endeavor to provide for: 1. Adequate drainage; 2. Appropriate medication by irrigation; 3. Prevent the ingress of air and the attendant pneumothorax and cavity formation; 4. Provide negative pressure suction to thoroughly remove the discharges and to aid in expanding the lung.

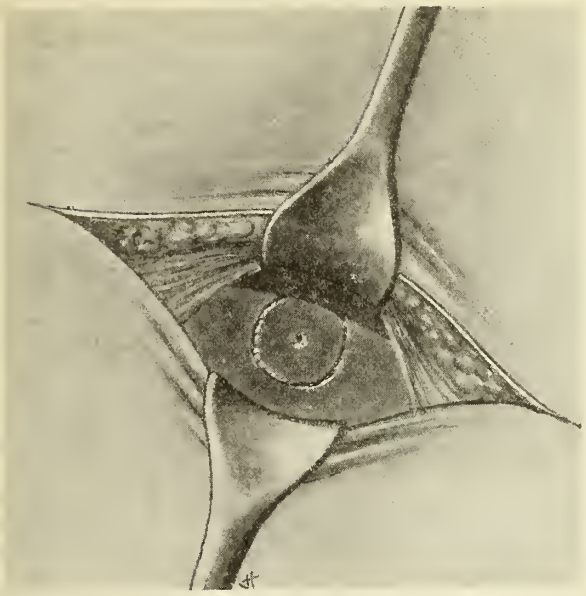


Fig. 3. When a narrow rib is encountered it is advisable to remove the button from the upper portion of the rib.

The following operation consisting of the trephining of a rib was first performed at the University Hospital six years ago. It affords an air-tight joint for the application of the continuous, even, negative pressure suction pump with provision for the Carrel-Dakin irrigation. The operation may be, and usually has been, performed under local anesthesia.

A short incision is made over and parallel to the rib at the site selected for drainage. This incision should not be made with the arm hyper-abducted, as the skin wound then will not overlie the rib without strain when the arm is brought down to the natural position of rest in bed. The periosteum of the rib is incised and separated only over the external surface. A button of bone is removed from the rib by a small crown trephine. When a small, narrow rib is encountered, it is advisable to remove the button from the upper portion of the rib, as shown in Illustration 3, otherwise fracture of the rib may obtain. The posterior periosteum and pleura is incised by a crucial incision through the bone hole, and a stiff, very snug fitting, rubber drainage tube, the same size as the trephine, is inserted, and forced into the drainage opening, forming an air-tight joint. The tube just enters the pleural cavity, must not impinge upon the lung and is hugged by the natural elasticity of the periosteum and pleura. This joint is further reinforced by bringing the drainage tube through a small perforation in the center of a square of dental rubber dam, which is fastened to the surface of the skin by adhesive tape covering the edges, as shown in Illustration 2. The position of the tube may be protected by placing a few turns of adhesive tape about it as it emerges from the rubber dam square, and fastening the same to the chest wall.

The negative pressure and irrigation apparatus, as illustrated in Figure 4, is now attached to the drainage tube. All of the drainage is collected in the first bottle. Any degree of negative pressure desired can be obtained and is

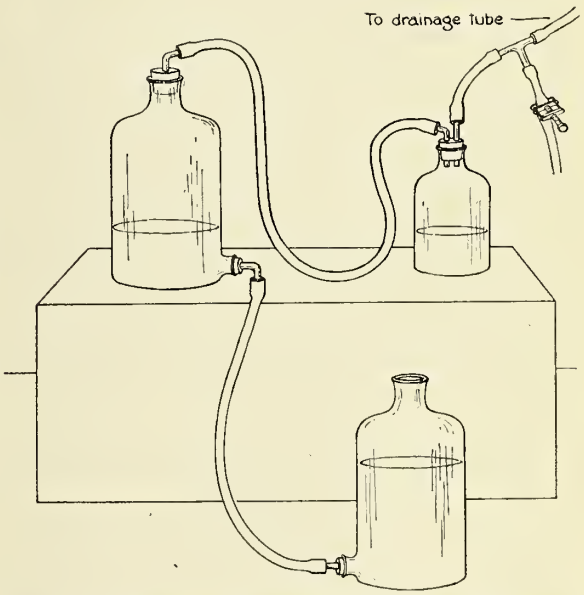


Fig. 4. The negatice pressure and irrigation apparatus. The drainage is collected in the first bottle. Any degree of negative pressure desired can be obtained by adjustment of the vertical distance between the water levels in the two large bottles.

measured directly by the vertical distance between the water levels in the two large bottles. There is some advantage in having a mercury manometer attached, for occasionally the negative pressure is deceptive if a column of air should occupy a section of the tube connecting the bottles. When the water in the upper bottle has drained away, it is necessary only to change the stopper and reverse the position of the bottles. When all connections are good, the apparatus needs no adjustment and functions perfectly for days at a time.

The operation has the following advantages:

1. Trephining a rib is much more simple than resection of the same.

2. Multilation, deformity, and spur formation with fixation to the adjoining ribs, is avoided.

3. Continuous, even negative pressure may be maintained, preventing pneumothorax and its attendant evils.

4. The negative pressure aids in the expansion of compressed lungs and cavity obliteration.

5. The function of all non-consolidated lung is conserved.

6. All discharges are collected in the receiving bottle, obviating the necessity of repeated dressings. This means much to the patient's comfort and cleanliness.

7. The suction prevents the accumulation and retention of pus in the pleural sac, and the absorption of the contained toxins.

8. The likelihood of introducing secondary infections is less than in open drainage.

9. Provision is made for the anti-germicidal and solvent action of the Carrel-Dakin irrigations.

10. When the infection has subsided and the pleural sac sterilized, a functionating lung capable of filling the thoracic cavity has been preserved.

DISCUSSION ON PAPERS OF DRS. STRACHAUER AND MANSON.

DR. ARTHUR T. MANN, Minneapolis: Unfortunately I did not hear the first paper and really have no right to discuss it. But I can hardly see how a trephine of the rib is better than a resection with the periosteum left in place. The periosteum produces new bone and we get quicker healing when we want to than we would where the periosteum is destroyed, as it would be by trephine opening.

I am very much interested in the paper of Dr. Manson. I was at the Base Hospital at Camp Dodge when these empyema cases started and Dr. Manson was taking care of them. I was in charge of the Surgical Service, and Dr. Manson afterward succeeded me when I left. He has done most of the work in regard to those cases.

We have an entirely different situation with the empyemas following the influenza than we had from the ordinary empyemas following the diplococcus of pneumonia. In the first place, our pneumonia and the empyemas in the ordinary diplococcus pneumonia did not start until the crest of the pneumonia was passing or had passed. The lung was getting better, so that what we had in the nature of an empyema we had in the presence of a recovering lung. With these cases of streptococcus empyema and the mixed streptococcus and the other germ empyemas which came with the influenza pneumonia, we had pneumonia in spots, a new kind of pneumonia in spots through the lung which is increasing and the empyema has come. The lung is getting worse; the patient is loaded with toxins; he is not recovering from his pneumonia; he has not had a crisis, with the temperature lowering and then beginning to go up with the empyema.

An operation which might be done with the empyemas after the ordinary pneumonia is wrong, particularly with the empyemas which come with the influenza, because we have a patient who is very ill, who has little resistance, and a pneumothorax at that time, with a lung which is laboring under all that it can carry, and a body which is under strong toxic conditions may often lead to a collapse on the operating table, and occasionally a death on the operating table, or with marked shock from which sometimes the patient never recovers when he gets back to the ward.

Coming to the Mezingo method, the doctor has brought out the points very clearly. If an empyema in a sick man is tapped and the fluid withdrawn, the lung has a chance to expand. That is one of the strong factors in favor of the method. Then, if by the injection of Dakin's fluid and withdrawal until it comes clear, we can more or less sterilize that cavity, we have added another factor which we have not been able to use before. Sterilization of the cavity, rapid expansion of the lung and the continued well being of the patient are the three points there. Just as an illustration, I had one man with streptococcus empyema and pneumonia of the mixed type. Under local anesthesia we withdrew a pint and a half, 750 c.c. of fluid without any trouble to the patient. A culture on the third day showed only two clumps of bacteria. The culture was not taken until the sixth day and it was sterile, or sometime between the third and sixth day it was sterile and stayed so. The tube was removed and healing was almost by first intention after the tube was taken away.

DR. O. C. STRICKLER, New Ulm: Although we all readily admit that there have been very great advances made recently in the treatment of empyema, still I predict that the last word has not been said in this direction.

We must remember that the epidemic through which we have passed was an unusually severe one.

The intense pulmonary congestion present in so many cases and the rapidly accumulating pleural effusion were not only prominent factors in considering the mortality rate, but also materially assisted in rendering an exact pathological diagnosis unusually difficult. This fact was brought out in a publication issued by Dr. Manson wherein he stated that some cases showed an accumulation of pleural fluid in twenty-four hours of from 1500 to 2000 c.c.

This condition muffled very markedly the chest signs and symptoms, as we have heretofore been unacquainted with such a rapid pleural accumulation in any form of chest infection. Some cases were aspirated too early, and as no fluid was found the procedure was not repeated, when had aspiration been performed later immense deposits would have been found.

If, as is so positively predicted, we are to experience the coming winter another epidemic, we must again use our aspirators whenever conditions point to this complication. Should fluid be found, we should evacuate the same only in line with the latest and most modern technic. I am, however, of the opinion that thoracotomy will still have its place in those cases where after the crisis has passed, immense masses of fibrin are retained, as I doubt if we can expect that either the Carrel-Dakin solution or any other preparation can disinfect such a deposit.

DR. H. R. WEIRICK, Hibbing: I have been very much interested in these two papers, and I gather from Dr. Manson's experience that he was dealing with acute cases mainly.

There is one feature regarding the method which he described which is very clearly illustrated by a post-mortem examination on a chronic case. If you will take an old chronic case of empyema and post it, you will find in the chest there are numerous trabeculae and signs in which the pus collapses. This condition is not due to an active condition of the organism that has caused the abscess particularly, but due to the negative pressure of which the doctor spoke; consequently if you take an old chronic case of empyema that has been opened wide and allow plenty of outside pressure to come in, these trabeculae lengthen, the sacs increase, and of course the quantity of pus increases with the surface that is exposed to pus formation.

The doctor's method of applying vacuum or making firm pressure is nearly as possible the correct idea.

Dr. Strachauer's idea of trephining a rib, it seems to me, would aid in a measure. But if you take a rib and trephine it, then put in a rubber tube on top of it, you do not have much more of an opening for drainage than if you used a good strong trocar between the ribs, and you might as well use the space between the ribs as to mutilate a rib. Moreover, I think the patient will recover just as fast when a rib is out as he would with the other process. I am guessing at this, but I think if you put a soft rubber tube in a trephine opening in the rib in a short time the formation of new bone would close in on the rubber tube so that drainage would be practically nil.

DR. ARTHUR N. COLLINS, Duluth: I have no quarrel with the essayists on the question of trephining or on thoracotomy. I want to touch briefly on the relative pathology with which we come in contact as we attempt to cure all these empyema cases from the early infection to the state of chronicity.

In the first place, we have a thin, yellow, fairly clear fluid, and that gradually progresses to a thicker fluid. In either of these stages it is easier to draw off the fluid by the trocar. The next stage is when we find the clotting of the pus. In this stage I fancy that the difficulties of the closed method are apparent. These clots will not go through the trocar. There is where the Mozingo method is criticized, and that is where Muscovitz, of New York, claims his method is superior. The injection of a small amount of Dakin's solution into these cavities will not dissolve these clots. You must have much more Dakin's solution than 50 c.c, and you must have it injected at much more frequent intervals.

I had the advantage of seeing these cases at Camp Dodge and of seeing them also at the Rockefeller Institute, and I later talked with Dr. Muscovitz, who was at the Base Hospital at Fort Thomas, and saw him illustrating his method of technic at this hospital. Some of these cases had been transferred from Camp Dodge to Fort Thomas and they were working on these cases.

Let me refer just a moment to the question of Dakin's solution. If you look on the bottles in which you receive the powder which is to be dissolved in water and called by the manufacturers "Dakin's new antiseptic" you will be inclined to believe you are working with Dakin's solution, whereas you are not. You are working with dichloramin-T solution. They will tell you at the Rockefeller Institute that dichloramin-T has not the solvent action that Dakin's solution proper has. Therefore, if you have Dakin's solution it should be made in the hospital where you use it, it should be fresh, and should be Dakin's solution and not dichloramin-T. You can use dichloramin-T solution after you have obtained the effect that Dakin's solution gives you at first. Therefore, after you have opened the chest by whatever method you chose, and if it is a method which will allow sufficient Dakin solution to dissolve the products of the inflammation, you will get a rapid cure, but you should see to it that sufficient Dakin's solution is used to dissolve the products of inflammation.

DR. CHARLES H. MAYO, Rochester: I think these are two very timely papers because undoubtedly we will have another epidemic of the influenza the coming winter. The closed methods of treating empyema, I believe, have proven their worth.

I was in Washington when the great epidemic of influenza occurred, and we had many, many cases of the disease scattered all over the camps with empyema as a complication. We had in one of the southern camps one of the best surgeons in the east, and he had in mind the ordinary method of treatment of pneumonia-empyema. He made a great many operations with a mortality of 64 per cent. On the other hand, from the west we were getting reports of the Surgeon-General's Office of the marvelous results obtained by closed methods of treatment,

and then we started out some of the men from these places, medical men and surgeons, and placed them in the different camps to see if we could not establish some uniform method of treatment, and the treatment followed resulted in a material increased percentage of recovery. I want to say right here, that sometimes we may not be as charitable as we ought to be in considering epidemics. Great contagions often start out of all sorts, very severe, and gradually some degree of immunity comes from the contagion being carried from man to man, and as time goes on these cases are not quite so severe. But all types of contagion affect man more or less so that we have some advantage in that line of natural immunity develop.

I was very glad Dr. Mann called attention to the fact that there are two types of pneumonia, and that the old type of pneumococcus pneumonia often begins in those cases that have undergone lysis, and even after they had quite improved they were found to have their chests full of fluid. There is no question but what years ago some of these cases were cured by one or two aspirations of the chest done early in pneumococcus pneumonia. However, it was never a very popular method of treatment. It looked non-surgical in the early days, and yet that was done. But the case that lived through the early period of treatment might come to the time when thoracotomy or the open operation offers the best results of any method of treatment. That is bound to occur in a few cases and can be relieved best by rib resection, but it is always to be remembered it is in the unusual case, and not the usual case that we are to accept today the treatment of influenza pneumonia by the closed method, and any man who makes the early open method must be in a position to explain the reasons for the early treatment by the open method.

DR. THEODORE BRATRUD, Warren: There are some of these types of empyema following the influenza epidemic that will not respond to the Carrel-Dakin solution and only small drainage, and these cases, as we treated them at Fort Thomas Hospital, were irrigated every two hours, and these cases that would not go down and the cavity would continue enlarging in size we subjected to the resection of several ribs. Colonel Heygrove took over the empyema work after Colonel Muscovitz, and in a recent conversation about two weeks ago he condemned the trocar and cannula method completely. They looked up eight cases at the Walter Reed Hospital that had been treated by debridement, and all of them had recovered. Every single one of them had been reoperated and the eighth was to be operated very shortly.

There is one very important point which lies in the treatment of these cases, and that is the posoperative treatment. These cases should be put on breathing exercises. Blowing bubbles is one of the best exercises, and it is surprising how fast these men will increase their lung capacity and how fast the blowing of bubbles raises the number of pounds of fluid after they have once started. By means of these graduated exercises it is surprising to see how fast these men will be able to pick up in strength and gain weight.

DR. A. R. COLVIN, St. Paul: As to the question of empyema, the cases I saw were largely these of the chronic type in the hospital with which I was connected. In these chronic cases we obtained results from almost every kind of treatment. Later on, however, I saw the results of the closed and open method of treatment.

It seems to me, a point upon which too much stress cannot be laid is the permanency of the individual case, the type of infection, and the morphology of the organism, it seems to me, does not always tell us the virulence of that particular organism. Certainly, from the results I saw in the chronic cases, with old thick walled cavities, there were not many trabeculae of a thick walled cavity with a branching out in some direction of the main cavity. These cases required the most mutilating operations, and any improvement that can be made in the early treatment is to be hailed with delight. There is no question that any number of cases are cured immediately in the course of a month or two by the open method. I have had that experience myself, and a number of men have had it. There is no question but what aspiration in some cases will cure them, and the results will be excellent. My own feeling is in a very virulent stage that rib resection, with drainage just as soon as it has been established that drainage is necessary, is better for the patient.

Dr. Manson touched on the question of the Dakin solution, and I happened to be at the Rockefeller Institute with Dr. Manson when he was there, and I heard this remark or statement made by Major Stewart who was in charge of that work. He said that some cases died, but in those cases that did not die and were treated by the open method, followed by Dakin irrigation, all got well definitely; that is, there were no after-results; there were no chronic cases. They either got well or died. My own exprience with the most desperate cases was that I did not think it made any difference what we did. In some of the cases we saw from the first death was stamped on them, and if you did not do a thing they died from infection. If you resected a rib they died; if you aspirated they died. The milder cases recovered. I think the majority of cases of empyema recover if they have not the awful virulence of the organism stamped upon them from the first. The majority of them recover as far as immediate recovery is concerned, but the horrible part to the surgeon who has to deal with these cases afterwards are the chronic cases with the old thick-walled cavities. Major Stewart said positively and repeated it, that with the resection of the rib or ribs, with definite drainage and irrigation with Dakin's solution, there were not any complications, and certainly that is something to be wished for.

Regarding the Dakin's solution, Dr. Manson stated very truly that these tablets do not represent Dakin's solution. The course given at the Rockefeller Institute taught us how to analyze and to use Dakin's solution as it should be used, and the exact strength according to definite rules, otherwise it was not worth while to use it at all.

DR. STRACHAUER (closing the discussion on his part): The lesson to be drawn from the recent vast experience in the treatment of empyema is the great advantage of the principle and methods as outlined by Dr. Manson and myself. This is one of the greatest contributions to the civil practice of surgery derived from the military experience in the last epidemic.

As we are all agreed as to the value of the closed method of treating these empyemata, the subject requires no further emphasis.

Regarding the trephine operation: The advantage of the trephine opening through the rib is that the rigid wall of the aperture accepts a stiff rubber drainage tube so that it can be inserted into the opening as snugly and tightly as a cork in a bottle. The joint is airtight. The difficulty with the catheter drainage method is the greater liability of leakage about the catheter in the soft parts. In comparing the caliber of the drainage tube used in the trephine operation and the size of the catheter, the difference is as between the size of my ring finger and a Number 24 catheter. The trephine operation is new, and it is hardly fair to pass judgment upon any procedure without having witnessed or practiced such operation. In civil practice we do not get these cases at the very early period experienced in military practice, where, as a matter of fact, the treatment of the empyemata was anticipated. Those of us who were so unfortunate as to have to remain at home had to deal with the farther advanced cases in which the pus was, frequently, very thick and contained large masses of fibrin. The discharge in our cases, in the majority of instances, was too thick to be evacuated through a catheter. The large drainage tube the size of the ring finger as employed in the trephine operation permitted the discharge of such heavy, thick pus and chunks of fibrin.

The trephine operation admits of the application of negative pressure which removes the discharges by suction, aids in the obliteration of the cavity, and promotes the expansion of the lung. It is more simple than resection, and the introduction of the tube into the aperture, fitting as tightly as a cork in the bottle, provides an airtight joint.

DR. MANSON (closing the discussion): We must agree that the ideal treatment for acute empyema is the one in which the mortality is the least. Operative interference should be undertaken first and last and in which the fullest recovery is obtained. We claim for the closed method all of those attributes, and we think statistics will show the superiority of this method over acute empyema, especially of the streptococcus type. I do not wish to have it understood, however, that this method is limited to the streptococcus type. We had empyemata of the pneumococcus type, of the staphylococcus and streptococcus type, and all were successfully treated by this method. In one of these cases there was a recurrence of the empyema which came from the spring epidemic. Many of these cases persisted after open thoracotomy, and I wish to emphasize the point that while I have spoken of this method as an ideal treatment for acute empyema, it is also applicable to the chronic cases. We had several cases of chronic empyema in which we resorted to the closed method, closing the original wound and obtaining sterilization of the cavity in a very short time. One case returned from overseas that had an open sinus for six months, and it was closed inside of two weeks.

The criticism that the method is not applicable where there are fibrinous masses is answered probably in this way: Ideally, the treatment should be instituted when aspiration is made and it is found we have infected fluid. This means that we are aspirating before we have these fibrinous masses and we prevent the formation of them. However, if we do have, as we find in some of our cases, something happen to them we have no trouble from them. You can take these fibrinous masses and put them in Dakin's solution and they will be dissolved. Of course, we do not suppose this method will be carwhile I have spoken of this method as an ideal treat-Dakin's solution is a solvent of proteid material, and it will prevent the formation of these fibrinous masses and help to dissolve them, so that the use of the Dakin's solution early in the disease will not only prevent the formation of these masses but the formation of adhesions and the formation of secondary pockets.

There is no doubt but that a great many cases of empyema go undetected, and it behooves us, therefore, to be on the lookout, especially in the influenza cases, for the occurrence of infected pleural fluid very early in the disease, coincident with the onset of the pneumonic process, then the introduction of this method will obviate many of the difficulties we have in the cases that come to us later. With our catheter method we have had no leakage; the cavity remained tight.

THE CORRELATION OF LABORATORY WITH CLINICAL METHODS IN THE STUDY OF TUBERCULOSIS*

By F. W. Wittich, M. D.
Minneapolis, Minn.

Frequently, the clinician is not versed in the practical application of laboratory methods and

*Read before the Mississippi Valley Anti-Tuberculosis Association, St. Louis, October, 1918.

the laboratory worker is a poor clinician. This applies especially to those who were graduated a decade or so ago and who have established busy lucrative practices with no time to study the more recent diagnostic methods. Begging the pardon of those who lay stress on the common sense diagnosis of tuberculosis more from symptoms and without the use of the microscope and the stethoscope, I might state that it would be a proper procedure for one deaf and blind but hardly applicable in the present age.

The successful clinic today depends upon the practical application of the newer diagnostic methods as furnished by the laboratory, which extends its use into the fields of investigation. This applies to the universal disease tuberculosis as much as it does to the more recent observations of diseases of metabolism. It is especially useful in the study of tuberculosis as an infection or disease in the broader sense of including a more or less general or localized disease in various organs, bones, glands, etc. The tuberculosis specialist who restricts his observations to pulmonary disease is sadly limited in his work with the disease produced by the bacillus of Koch.

It is surprising upon what a slender basis the diagnosis of tuberculosis is sometimes made by placing the greatest emphasis upon relatively insignificant signs. For instance, the diagnosis of pulmonary tuberculosis on dullness at one apex probably may be justified in civil life, but surely would not be so in military life as Colonel Bushnell has recently pointed out. To justify such a diagnosis on the grounds that the rest and change of air will be beneficial and at least not harmful, is not scientfic. It is taking advantage of the fact that it is easier to call a condition tuberculous than to prove it otherwise. Two cases recently came to my observation which had been diagnosed as pulmonary tuberculosis by reputable internists. Being unable to find any evidence of the disease in one case and slight if any, in the other, I referred the patients to a renowned tuberculosis center with the result that after thorough examinations with the abundant methods at hand, the former was told that she was free from the disease and the latter that they would not like to be asked to make a definite statement concerning the location of his tuberculosis. It is incidents such as these that make one desire for uniformity in methods and standards of diagnosis with a better understanding of clinical and laboratory means in arriving at safe conclusions. No one will doubt the absolute necessity of a carefully gleaned history, the grouping of symptoms, and a painstaking physical examination augmented if possible by the fluoroscope or roentgenogram, but all these may fail. The protean manifestations of the disease may obscure our perspective and be entirely misleading. After a most careful study of the troops, medical military observers were surprised at the number of demonstrable pathological lesions without symptoms of disease and with histories of nothing but good health. This is especially true in cardiac lesions and were all the men subjected to a roentgenogram of the lungs it would no doubt be verified in tuberculous ones also. If all the men who are tuberculin sensitive were condemned there would be great confusion.

It is a well balanced judgment of the value of any test, clinical or laboratory, in a particular case that makes for accurate diagnosis. On applying the various laboratory tests one must have clearly in mind just what information he seeks. As stated, the patient's history, percussion and auscultation, the thermometer and scale as well as both radioscopy and radiography may fail to clinch the diagnosis between a definite disease requiring active therapeutic measures and an infection severe enough to indicate what Lawrason Brown calls a God-fearing life.

What other means have we that may aid us, yield a clue, strengthen our convictions, augment facts and give us assurance?

Obviously, the first aid is the microscope. Since the classical observations of Koch that led up to his discovery of the tubercle bacillus, the microscope has placed on a scientific basis and beyond all controversy what Laennec had so brilliantly crystallized into an accurate clinical grouping. It is now relatively simple to examine any fluid or tissue of the body for the tubercle bacillus. The adoption and persistent use of one method is better than to have the laboratory posted full of directions never practiced, and an attempt shall be made here to describe one method which has proved satisfactory for each test.

The acid fast properties of the tubercle bacillus or its resistance to decolorizing by acids is

so well known that the writer begs indulgence for mentioning it, yet many cannot make a good sputum smear and stain it properly. Without entering into the details of a good microscope, clean slides, properly standardized reagents, etc., I should like to mention the necessity of selecting cheesy-appearing or heavier particles of pus from a sputum specimen and compressing them firmly between two slides so that a thin uniform film is the result. Tubercle bacilli will frequently be demonstrated in a smear made by observing these hints when less carefully prepared slides from the same specimen were repeatedly negative. Steaming the stain on the slide for five minutes (don't defer your diagnosis another day by staining in the cold), decolorizing with 3% acid alcohol and counterstaining, not too deeply, with Loeffler's methylene blue always makes a good slide whatever the material. If negative, a simple concentration method such as digesting the sputum in an equal part of 30% antiformin for about an hour then sedimenting and staining in the usual manner may demonstrate the tubercle bacilli. Feces, and pus from cold abscesses or suppurating glands are best examined in this way. Fine sediments from digested material or from urine can readily be fixed in a thin smear of egg albumin preserved in 5% carbolic solution. Sedimentation of the tubercle bacilli in urine is greatly hastened by the addition of one-third alcohol before centrifuging.

All expectoration from the bronchi is pathological and should be examined for tubercle bacilli, which examination of sputum is necessary for the proper classification of all patients. Even if the chest shows undoubted evidences of the disease the finding of tubercle bacilli in the sputum, which is many times the only conclusive proof of the disease that will be accepted by the laity, makes it necessary to take measures for the protection of others as well as for the safe-guarding of the patient from reinfection. What significance have bacilli in the expectoration regarding prognosis? Heise recalls the fact that in an open case or when tubercle bacilli occur in the sputum, "new areas may be infected by aspiration or by back pressure during cough. The lesion then is a more dangerous one although unaccompanied by symptoms of activity." In such a case there is also less chance of the focus being inactive and greater danger of relapse. In group studies of 1400 cases whose fate was known ten to nineteen years after discharge from the sanatorium, of those who had definite tuberculosis but no bacilli in the sputum 81% were alive; of over three times that number who had bacilli present, only 59% were living; or, roughly speaking, the chances of those with positive sputum are lessened about 20% over those whose sputum is negative.

When tubercle bacilli are found, and they were found in 71% of Heise's 1,400 cases, what further study of the smears will be of value? Joseph Pottenger in 1917 drew attention to the value of interpreting the degree of bunching of tubercle bacilli; their relative length and staining characteristics; their relative number and the degree of phagocytosis of bacilli by the formed elements native to the sputum.

Working largely with cases of advanced pulmonary tuberculosis he evolved a system of sputum analysis which gives a more thorough complete picture of the degree of activity and extent of involvement than has been offered by other laboratory methods. Further than this it has made it possible to interpret with a greater degree of certainty many of the symptoms and complications both tuberculous and non-tuberculous which occur during the course of the disease.

His ingenious technic of measuring the bacilli, etc., is described in Pottenger's *Clinical Tuberculosis* which is readily accessible. Briefly, the method of sputum analysis consists of correlating the various findings quantitatively of a total twenty-four hour, two-day or three-day sputum and is described as follows:

"The sediment volume is a measurement of the cellular elements of the sputum; the number of bacilli is expressed by the product of the number per field by the number of cubic centimeters of sediment volume; the length index of tubercle bacilli is a number expressing the relative length of the bacilli; and the albumin content is expressed by multiplying the denominator of the fraction representing the dilution recorded by the total number of c.c. of sputum, i.e., in sputum of 50 c.c. which gives the standard reaction for albumin at 1/20 dilution the relative albumin content would be expressed by 1/20x1/50 1/1000. In following the course of uncompli-

cated tuberculosis, the sediment volume and length index are by far the most important determinations; the former expressing the extent and the latter the degree of activity of the disease."

Pottenger continues with the statement that when there are complications the relative number of bacilli is an important aid. In pulmonary abscesses when there is an appreciable increase in the sediment volume the number of bacilli remains constant or diminishes. When tuberculous laryngitis develops the total amount of sputum is greatly augmented while the volume of sediment, bacilli number and length index remain the same unless a cavity forms in the lung simultaneously. Any non-tuberculous complication causing an increase of laryngeal or bronchial secretion may be differentiated from cavitation by determining the sediment volume. The sediment volume of epithelium due to catarrhal conditions rarely exceeds five tenths c.c. while the leucocyte volume in moderately advanced cases ranges from 1 to 5 c.c. and from 5 to 10 c.c. in far advanced cases. In lung abscess the volume is 25 c.c. or more. Pottenger's observations agree with those of others concerning the albumin content of the sputum in that it seems to indicate activity although its determination proves of least value. Cytological studies of homogenized sputum made by shaking two to five minutes showed that the lymphocyte count increases with the abatement of clinical symptoms coincident with diminished sediment volume and the raising of length index of the bacilli.

The relation between clumping of the bacilli and activity has been shown. Clumping is an index of increased activity and as the bacilli become longer the bunching becomes less. In brief, if a patient is not doing well the sediment volume becomes greater, there is a larger number of bacilli, there is more sputum, the albumin content is higher and the number of the shorter rods is increased. To determine the length index of 300 to 500 bacilli requires five to ten minutes and the chemical tests mentioned will take from ten to fifteen minutes longer.

Holmes and Chambers' method of determining the albumin content in the sputum is as follows: Place 10 c.c. of sputum in a 50 c.c. graduated glass-stoppered bottle. To this add three times its volume of water containing 1% acetic acid, diluting the sputum to 25%. After shaking vigorously, filter 10 c.c. through a filter paper directly into a graduated centrifuge tube. Add to this 5 c.c. of a 5% potassium ferrocyanid solution in water and centrifuge for 5 minutes at average speed. The amount of albumin is conveniently recorded in volume percent, each tenth c.c. in the tube being 4% by volume after correcting for the original dilution. Many use the Esbach albuminometer and Esbach's reagent as in urine. It has been shown that when the volume percent of albumin in the sputum exceeds one or two percent and there is a sputum lymphocytosis of 50% or more, a tentative diagnosis of pulmonary tuberculosis is justifiable even though the tubercle bacilli may not have been found.

A study of the secondary organisms in the sputum may prove of value when there is an increase in symptoms. For instance, in sputum examinations of 196 patients by the writer the staphylococci, being lytic, were frequently found in those chronic cases with cavity formation, limited toxic effect and low pyrexial symptoms, but the organism is low in its acceleration of the growth of tubercle bacilli. The pneumococcus, containing both endo and exotoxins but showing some lysis, produces more marked toxic effects and less cavitation, and it is next to the streptococcus in its accelerating power of the growth of Koch's bacillus. The catarrhal group of Gram-negative diplococci represented by the m. catarrhalis, with no lytic power or exotoxin, produces catarrhal symptoms principally as well as slight pyrexial symptoms although there may be some excavation. This group stands about fourth in its power of stimulating the growth of tubercle bacilli. B. influenza with its powerful endotoxin, produces marked pyrexial symptoms but little excavation, and it ranks next to the pneumococcus in activating the growth of tubercle bacilli. The severity of the infection would depend on whether one or more of the secondary organisms were present.

A study of blood in tuberculosis is of unquestionable value. The researches of Arneth calling attention to the morphology of the nucleus in neutrophil leucocytes especially in tuberculosis stimulated many observers to con-

tinue this line of investigation and their results have been in the main confirmatory. Arneth developed the theory of changes in the nucleus during growth of the neutrophilepolymorphonuclear leucocytes and divided the neutrophiles into various classes according to the number and shape of the nuelear segments. In various diseases the differential count of the neutrophiles very often shows an abnormal predominance of the younger forms of the eells whieh he ealls a shifting to the left in his blood picture. This shifting is very characteristie and represents a definite reaetion on the part of the organism to the infeetion.

Miller and Reed studied 78 eases making 315 eounts. They found that the normal pieture was as follows, the Roman numerals representing the number of lobes to the eell and the Arabic the percentage of cells: I/5 II/26 III/36 IV/28 V/5 making a normal index of 49:51 using elasses I and II and a half of elass III as one side. Thus any index between 45:55 and 55:45 may be ealled normal. In tuberculosis there is an increase in the single or two lobed eells and a deerease of III, IV, and V. Further there is a shifting to the left as the disease progresses, the average ratio for an incipient ease being 64:36; advaneed 67:33; far advaneed 75:25; and the moribund 66:34. A good prognosis shows 60:40 and a poor one, 72:28.

The technic, as in all aeeurate work, must be uniform, the speeimens of blood obtained in the afternoon three or four hours after eating, and other eauses of leueoeytosis, as eold baths, ete., should be avoided. The blood smears must be thin and even, fixed and dried in the air. Use fresh Wright's stain. Cover slide two to three minutes and then dip several times into distilled water to whieh Wright's stain has been added to distinetly color until exaet shade of film is obtained. One hundred neutrophiles are counted with each operation.

A ease progressively becoming worse will show a leueoeytosis, an increase in the neutrophiles, a deereased pereentage of small lymphoeytes and eosinophils and shifting to the left of the Arneth blood pieture. A ease pro gressively improving will present a direetly opposite pieture.

Aecording to Burgess, the presenee of a high pereentage of immature polynuclear leueocytes in the circulating blood (Arneth's "shifting to the left") is evidence of excessive loss of these eells from the blood stream and an attempt on the part of the bone marrow to make up the defieieney. It does not indieate the degree of toxemia nor is it an index of the patient's resistanee to infeetion. In tubereulosis a shifting to the left means necrosis and extension of the lesion. In early eases it may be of considerable value in immediate prognosis and even at times in diagnosis. In advanced cases there is so much of a variation and so little information that is not already possessed that it is of no value. However, leucoeytosis is evidence of toxemia and of a definite value, and a lymphoeytosis is suggestive of tuberele bacilli stimulaton, so that an Arneth eount that may be done simultaneously with a differential eount, may be worth the time spent on it in eertain eases.

If tubercle baeilli are not found in the sputum examine the stool, as they may be demonstrated in the feces sometimes before being discovered in the sputum. Approximately 60% of eases with positive sputum with no symptoms or signs of intestinal tuberculosis will have the baeilli in the feees. Sometimes a patient unconseiously or willfully swallows sputum and denies expectoration, so that a stool examination under the pretext of studying some bowel eondition may give results. Stool examination for tubercle bacilli is also of value in children with tuberculous bronchial uleeration and from whom it is difficult to obtain a speeimen of sputum. The antiformin method of digesting the feces as in sputum eoncentration is very satisfactory, yet plain smears show them as well. It is best after deeolorizing not to eounterstain where there are such large numbers of other organisms. The tuberele bacilli stand out against a white or colorless baekground.

Certain urinary findings may be of value in differential diagnosis as well as in confirming previous impressions. Weisz, in 1911, noted a marked inerease in uroehromogen in the urine of tuberculous individuals. Sinee then many observers have obtained such eontradietory findings that it is doubtful if the urochromogen output is in any degree a measure of tissue destruction. Aecording to Weisz the normal

pigment of the urine is derived from chromogen, and when this is oxidized, as by a solution of potassium permanganate, it is changed to a pure urochrome of the urine.

To make the test is simple. Dilute five cubic centimeters of urine with ten cubic centimeters of water. Pour half into another tube for comparison. Add two or three drops of a dilute (1-1000) permanganate solution. A positive reaction is indicated by the appearance of a distinct yellow color that persists. The reaction is present in typhoid as the diazo-reaction and so is not specific for tuberculosis. It is probably of more value as a negative than as a positive test, for a negative reaction is obtained in a much higher percentage of non-tuberculous cases than a positive reaction in the tuberculous ones.

The urinary findings in functional renal tests in tuberculosis have been proved valuable by Mills and Henderson. This is especially true of genito-urinary tuberculosis. They have found that renal tuberculosis and apparently extra-renal genito-urinary tuberculosis give a characteristic picture with Mosenthal's test that may be of help in diagnosis. Genito-urinary tuberculosis may show an altered renal function with the Mosenthal test, when the other tests in this condition, or even the presence of albumin or casts may show little or no decrease in function. This test has given a characteristic picture in renal tuberculosis before the development of any clinical symptoms.

In uncomplicated pulmonary tuberculosis functional renal tests are of little value, but when there is any suspicion of nephritis or genito-urinary tuberculosis, or when the urine shows albumin beyond a trace or casts other than hyaline, even in the absence of clinical symptoms, a Mosenthal test and a phthalein test should be made for the valuable diagnostic and prognostic helps they may afford.

The test essentially consists in giving a three meal standard diet two or three days preceding, which diet contains approximately 1760 c.c of fluid, 8.5 grams of salt and a normal amount of protein. The urine is collected at two hour intervals from 8:00 A. M. to 8:00 P. M. and the total night urine, from 8:00 P. M. to 8:00 A. M. Measure the amount of each specimen and take the specific gravity. The amount of salt in the total day and night specimens may be determined but is not necessary for diagnostic purposes. Normal function shows the following: The night urine should not exceed 400 c.c. in amount, the specific gravity of the night urine should be 1.018 or over, and there should be a range of at least nine points between the highest and lowest specific gravity. The water excretion also shows a wide variation between the two-hour intervals. In disturbed renal function due to disease, the kidneys act less like a functioning glandular organ and more like a mechanical filter. The night urine is increased with a low specific gravity and there develops during the day fixation of volume and specific gravity, or in other words the two hour daily output and specific gravity become more constant.

Many attempts have been made to adapt serological methods in the diagnosis of tuberculosis as in syphilis, and much interest has been aroused recently in the complement fixation test in tuberculosis. The observations, as initiated by Bordet and Gengou in 1903, and by the early investigators such as Wassermann and Bruck and Citron were far from uniform because of technical difficulties. Aside from sporadic observations the subject did not promise particular results until improved methods were introduced the past few years. The proposal of various antigens and modifications followed so quickly the nearly specific results of Besredka and the users of his antigens or modifications, particularly the French observers, as well as Craig and Bronfenbrenner, that the literature of the subject has become very extensive. Antigens of bacillary suspensions, filtrates or tuberculins, and various extracts as well as different tissue extracts have been used. More recently the observations of Miller and those of Petroff would indicate that the complement fixation test in tuberculosis is approaching the much desired specific quality.

The writer attempted to employ these modern methods of the fixation test on a hundred cases using various antigens both in the fixation and skin tests. The results of this work have been reported elsewhere and they have been very encouraging. The subject is too broad a one to be discussed here but briefly. It may be stated that with a careful selection of antigens

and uniform methods the results have pointed toward a practical use nearly as valuable as the Wassermann test in diagnosing syphilis. It must, however, be kept in mind that there will always be difficulties in the diagnosis of tuberculosis by biologieal methods as Bronfenbrenner has pointed out. Even when specific in character these biologieal tests, the Pirquet test for example, do not differentiate between tuberculosis as an infeetion and tuberculosis as a disease.

In practice I have come to use a routine complement fixation test and intracutaneous test on all doubtful or concealed eases of tuberculosis. Besredka's or Miller's antigen is used in the fixation tests and Koeh's O. T. 1/10 c.c of a 1 to 100 dilution intraeutaneously. A three or four plus positive reaction together with a definite eutaneous response is eonsidered sufficient evidence of tuberculosis to be treated as such until proved otherwise. Petroff's antigen is used to determine lateney. The value of these tests when negative, particularly of the various skin tests must be reeognized by everyone.

The time will not permit more than a brief mention of other laboratory methods employed toward helping to diagnose tuberculosis. Animal inoculation, baeteriologieal studies of the blood, the pulmonary differential test known as the salicylic test of Falk and Tedesco, the study of the ferments of the sputum, etc., all have some value and are worth investigating.

The internist may remain unconvinced of the value of eorrelating laboratory tests with clinical findings and feel that the former are not necessary or perhaps too complicated and time-devouring to warrant their trial, but when he faces the case, and I do not deny it is most frequently the exeeptional one, where his skill in clinical work refuses to help him make a satisfactory diagnosis then let him turn to the laboratory. If he will investigate the unlimited opportunities it affords him to study that patient and so a whole new class of them, let him try out these various tests, let his interest be fully a roused to their possibilities and he will make time to work out some of the problems his enthusiasm has opened up for him. With the new found knowledge of the data his observations will furnish him he will have a broader and firmer information of the subjeet at hand, and his perspeetive in the study of a most interesting yet elusive disease will be greatly enlarged. He will then refuse to become stagnant in his praetiee of medicine but will rise out of the rut of routine and study the problems that make for scientifie progress.

EPIDEMIC INFLUENZA: REPORT OF 296 CASES AT THE UNIVERSITY HOSPITAL, MINNEAPOLIS, MINN.

By Edgar T. Herrmann, M. D.
St. Paul, Minn.

The object of this report is to summarize the influenza epidemie as seen at the University hospital from October 11th to November 11th, 1918, inclusive. The paper is based on the study of 296 cases chosen during the month when the epidemie was at its height. For the sake of simplicity the results of our investigation will be presented in tabulated form.

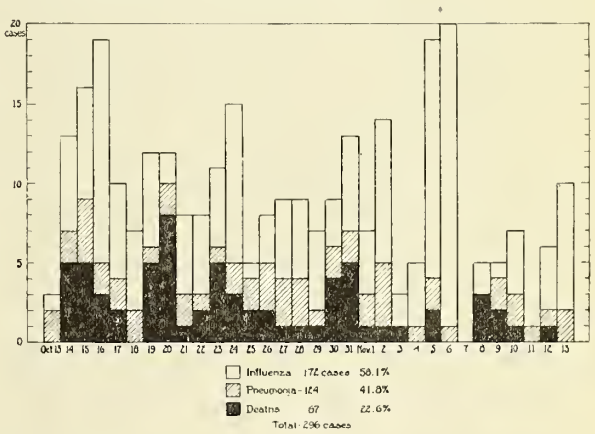


Chart 1 shows graphieally the number of cases of influenza, pneumonia and deaths on each day during this period. It will be seen that the time from Oetober 14th to November 3rd, that is, the first 22 days, represent the height of the epidemie. Oetober 20th shows eight deaths. This day represents the acme of fatalities as well as admitted pneumonias. It is important here to note that many of the pneumonias admitted were praetieally moribund on entrance and the computed figures are based on all pneumonias, whether these were contraeted inside or before coming to the hospital. (The percentage values are given in the figure.) The death rate

in pneumonia reaches 54 per cent, but is not strictly accurate as the fatality proportion under treatment, because of the large number of cases admitted in a dying condition.

SUBJECTIVE SYMPTOMS

Characteristic of practically all cases was sudden on-set, weakness and marked and immediate prostration. Headache, backache, general body pains, and pains in the extremities, were mostly either all or partly present. A large number of patients complained especially of chest soreness, usually substernal. Chills and sweats were found less frequently. Tinnitus and vertigo were occasionally parts of the picture. Gastro-intestinal disturbances ocurred in a certain number of admissions and were marked by nausea, vomiting, anorexia and diarrhea. On the cardio-respiratory side, coryza, cough, sore throat, chest pains on expectoration, formed the dominant picture. In a few cases nocturia was a prominent symptom.

PHYSICAL FINDINGS

1. Simple Influenza.

Here the usual findings were:

(a) Conjunctival irritation of all degrees.
(b) Dry, raw or beef-steak naso-pharynx, tongue and tonsils.
(c) Occasional epistaxis.
(d) Occasional slight cyanosis.
(e) Slight acceleration of pulse and respiration.
(f) Occasional moist and dry rales over the larger bronchi.
(g) Occasonal vertigo.
(h) Usually marked abdominal flatulence.
(i) Usually constipation, less frequently diarrhea.
(j) Occasionally abdominal pain and tenderness.
(k) Occasional psychic disturbances with low temperatures.

2. Pneumonia.

(a) Cyanosis—This ominous and striking sign was present in at least half the cases. During the height of the epidemic cyanosis was an almost invariable harbinger of fatality. Peculiarly, it was often present from one to three days before any objective signs of consolidation could be determined, also it was practically never accompanied by evidences of right heart dilatation. This sign will be mentioned again in connection with chemical studies of the blood.

(b) Marked acceleration of respiration and pulse was constant and often present some time before objective consolidation appeared.

(c) Sputum—This was thick, tenacious, muco-purulent and blood streaked, and came up as plugs in a thin pearly colored fluid.

(d) Consolidation—As Christian has observed, we found that the pneumonic process was usually first discovered at the scapular angles behind, spreading from that point. All degrees of involvment were noted, from patches the size of a dollar to a massive infiltration of both lungs. The advancing order of physical signs was usually:

1st. Slight suppression of breath sounds over involved area.
2nd. Slight impairment of resonanee to percussion.
3rd. Suberepitant and crepitant rales.
4th. Bronchovesicular and b r o n c h i a l breathing with percussion dullness.

(e) Severe epistaxis and bleeding from the gums was occasonally met with.

(f) The tongue presented a dry, furred, brown and cracked appearance, as did also the lips.

(g) Striking abdominal distension was always present.

(h)) Emesis and diarrhea were marked in certain eases.

(i) Talkative delirum and uncoordinated muscular twitchings characterized the end stage of some pneumonias.

(j) Pulmonary oedema was often present.

(k) Cardiac dilatation with right heart failure was rarely present.

BLOOD PRESSURES

1. Blood pressures in cases of influenza were taken on 44 individuals, the group average showing a systolic pressure of 108 with a dyastolie pressure of 58.

2. Thirteen eases of severe pneumonia gave very low readings, viz: an average systolic pressure of 95, with a dyastolic pressure of 56.

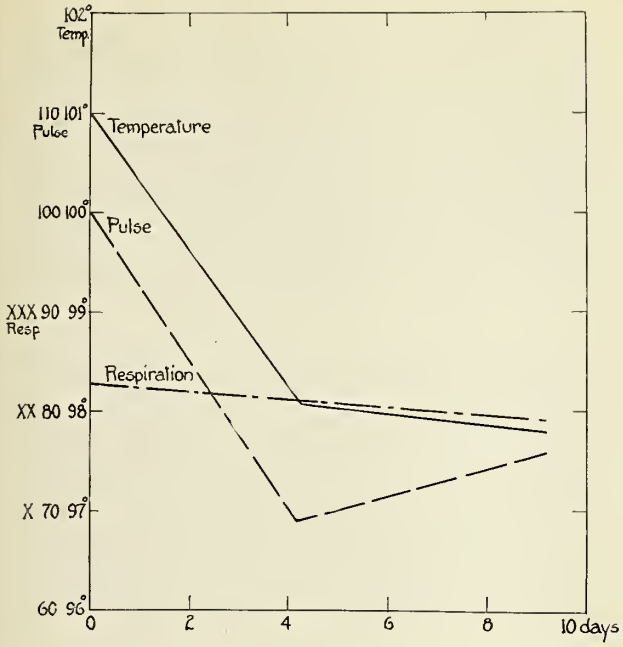


CHART 2 is a composite graph of pulse, temperature and respiration reactions in 172 cases of simple influenza. The high points represent values on admission. The graph thus shows the return of temperature and pulse to normal on the fourth day after admission, the drop usually occurring by sharp lysis. The average patient was not discharged until five days after this period, i.e., on the ninth day after admission. Respirations throughout were practically normal.

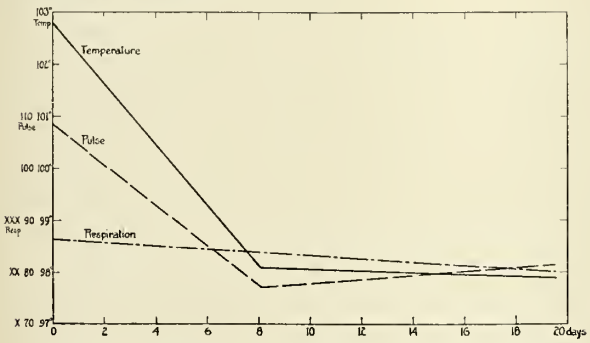


CHART 3 shows an average for 124 cases of pneumonia with recovery. A comparison with Chart 2 reveals the very interesting fact that the time element in pneumonia is practically double that of influenza; thus in pneumonia the drop in temperature and pulse occurs on the eighth instead of the fourth day. The average patient was kept in the hospital eleven days after this period, a total of nineteen days. *Insofar as averages can be considered valuable, this means that an influenza which continues febrile over four or five days should be considered as a pneumonia, in spite of the absence of physical findings.* Here again the drop is by sharp lysis, the pulse falling to 76 instead of 68, as in the former chart. The respiratory rate of 26 on admission usually falls to normal within 12 hours of the accompanying temperature and pulse decrescence.

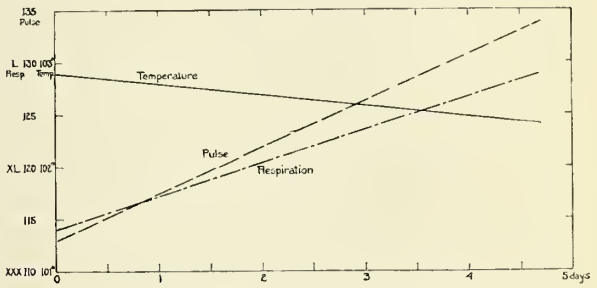


CHART 4 portrays the reaction in fatal cases. Here the length of life after admission is a little over four and a half days; however, one should remember that this is perhaps too brief an interval in many cases, since this graph is modified by records of individuals moribund on admission. The fatal crossing of temperature on the one hand, and pulse and respiration on the other, occurs here on the third day.

BLOOD STUDIES

Leucocyte counts were made in all cases and in many also complete blood counts and hemoglobin estimations were determined. Here for the sake of accuracy leucocyte counts on 20 cases are presented. These were hospital nurses with simple influenza who were put to bed on the first day of the disease, the counts being made on the first or second day by Dr. Warwick, hospital pathologist. They show a uniform leucopenia averaging 5,775 leucocytes per cubic millimeter.

Outside of this series the highest count recorded is one of 28,000 in a case of empyema. Many of the pneumonias showed leucopenia, few gave counts over 10,000.

The differential count, red cells and hemoglobin, remained normal in practically all cases.

URINE

1. Urine in cases of simple influenza was normal throughout.
2. Cases of pneumonia showed urine containing albumin often in large amounts, hyalin

and granular casts, and occasionally red blood cells.

BLOOD CHEMISTRY

Chemical blood studies were made in a series of 20 cases. Urea, nitrogen, creatinine and uric acid show practically no increase over the normal, thus nitrogen retention is clearly ruled out. Only one case showed a creatinine over three milligrams. On the other hand, there was a marked variation in the alkaline reserve. The fatal cases in the series studied for the most part showed a high alkaline reserve, at times approaching alkalosis, others showed a lower reserve. The variation was from 50.19 as highest figure, to 37.2 as low figure. Nine cases showed figures above 45, and four cases showed figures below 40. In none of the latter was clinical acidosis evident. The fact that many of the patients with high values were pushed to the limit of tolerance with salicylates in combination with sodium bicarbonate may explain some of the high values; however, low values were obtained under the same conditions. The explanation of the cyanosis on a basis of acidosis was thus found untenable.

BLOOD CULTURES

A series of blood cultures was taken on 15 patients with fatal pneumonias, the cultures being obtained at the height of the infection. Of these, three were found positive, the organism recovered being a pneumococcus.

BACTERIOLOGY

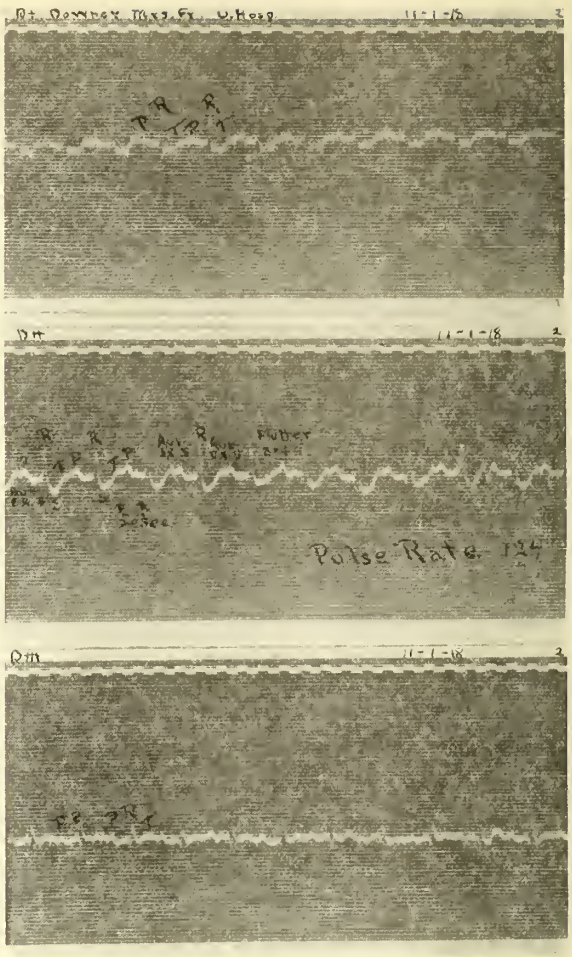
Dr. Larson, university bacteriologist, has made extensive studies of this phase of the epidemic. Briefly, his results on hospital cases have shown:

1. Sputum examinations that yielded pneumococci and streptococci together with, in some cases, influenza bacilli.

2. Blood cultures in cases of early pneumonia that were for the most part negative, some, however, showing pneumococci of types 2, 3 and 4, and other streptococci, occasionally hemolytic, often nonhemolytic.

TREATMENT

General measures instituted in every case consisted of absolute rest in bed, a high carbohydrate diet, forced fluids and free catharsis. Occasionally for the control of high temperatures sponge baths and Priessnitz compresses were employed.

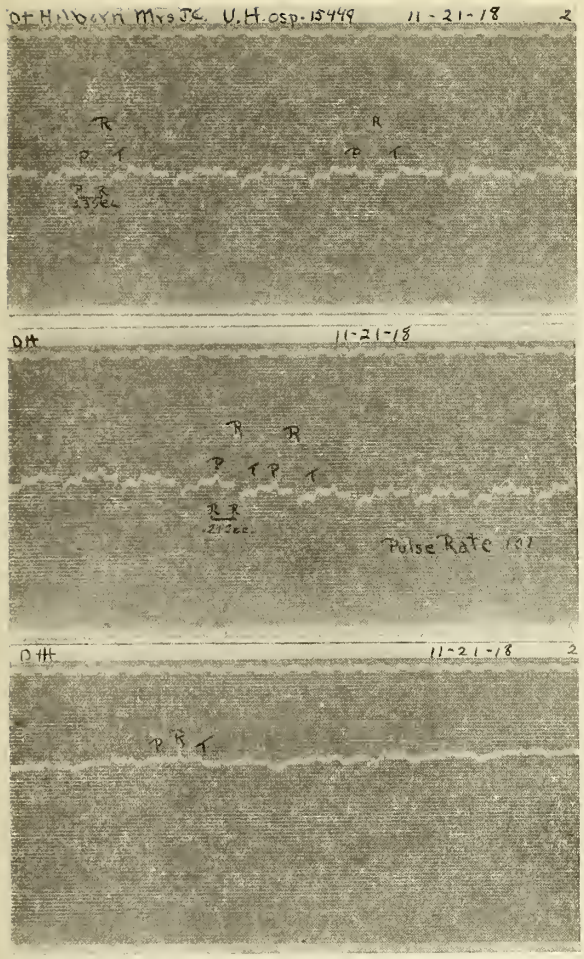


CARDIOGRAMS

Two cardiographic records are appended.

No. 1 is reproduced as of interest because it shows auricular extrasystoles in the second lead, as well as a lengthened P-R interval and partially inverted T wave. The two latter are digitalis effects; the former most probably an index of myocardial toxicity, which is also evidenced by the limited excursions of the galvanometer throughout. The patient was one with empyema following pneumonia from which she did not recover.

No. 2 is shown principally to illustrate how efficiently digitalis therapy was carried out in chosen cases. The drug was given in certain cases to study its effects, if any, on cardiac rate, but was found unsatisfactory. The cardiogram shows a rate unaffected by digitalis even though a lengthened P-R interval and an inverted T wave point to a maximal therapeutic effect of the drug.



Measures used to combat the infection directly may be listed as follows:

1. Drugs.
   (a) Salicylates.
   (b) Quinine derivatives.
   (c) Atropin.
   (d) Supportive and adjuvant drugs.
2. Vaccines.
3. Phlebotomy with infusion of Fischer's solution.
4. Convalescent serum.

Drugs—A careful comparison of all cases in which drugs were used leads one to the general conclusion that none were efficacious in combating the infection. Groups were established, some of which received only quinine derivatives, others only salicylates, and still others that received no medication whatever. When used the drugs were pushed to the limit of tolerance. A comparison of temperature and pulse curves in the three groups shows no appreciable difference between them nor is there any evidence to show that the course of the infection was made shorter by either of the drugs used. As a possible preventive of pulmonary oedema, atropin sulphate subcutaneously and by mouth was given in heavy doses. In severe cases 1/25 gr. was given twice a day for two days. The value of atropin for this purpose is very doubtful. A review of the cases shows that pulmonary oedema developed in certain ones in spite of its use and remained absent in others where atropin was not used. Judging from physical signs there was only one case in which it was felt that the use of atropin aborted a beginning oedema. Adrenalin and pituitrin were used in a few cases for the same purpose but without definite effect. Supportive and adjuvant measures employed consisted of digitalis, strophanthin, caffeine, camphorated oil and adrenalin on the cardiovascular side; codein and its derivatives and expectorants for the control of cough; morphine in chosen cases as a sedative; and glucose enteroclysis with saline to aid metabolic and water loss. These it is felt, were all of temporary value only.

Vaccines—Rosenow's vaccine and a mixed vaccine of the same type prepared by the department of bacteriology of the university, were used in 15 cases. The vaccine was given subcutaneously in one-half to one c.c. doses usually on three or four successive days after admittance for the possible prevention of pneumonia in cases of influenza. It was used also in cases of pneumonia. Here again the results obtained are questionable. One can only say that in a few cases, four to be exact, there was a definite drop of temperature and pulse on the day following injection. Eighty per cent showed no demonstrable improvement.

Phlebotomy with Infusion of Fischer's Solution—This was employed in 23 cases to relieve toxicity and circulatory embarrassment. Twenty-one of the cases had a fatal issue.

Convalescent Serum—Intravenous injection of serum was used in only one case and here proved unsuccessful. The single case admits no inference.

The course of the disease as observed in 20 nurses who were put to bed on the first day of illness shows that this measure, together with good nursing and general eliminative methods, was perhaps the most satisfactory. Two of these

nurses developed pneumonia and one died. Thus it appears that patients who were put to bed immediately on developing symptoms had in this measure the best of all safeguards against fatality. Here I might add that during the epidemic every nurse on duty was compelled to report morning and evening to have the temperature taken. On the appearance of the slightest rise above the normal, the nurse was at once ordered to bed. Herein perhaps we have the greatest safeguard against a serious issue.

COMPLICATIONS AND SEQUELAE

These are briefly summed up in the following list:

		Cases	
1.	Otitis media	9	
2.	Otitis with mastoiditis	1	
3.	Frontal sinusitis	3	
4.	Empyema	4	(3 died)
5.	Acute nephritis and myocarditis	6	(6 died)
6.	Edema of glottis	1	(1 died)
7.	Encephalitis with otitis	1	
8.	Toxic icterus	1	(1 died)
9.	Acute myocarditis	1	(1 died)

PATHOLOGY

A brief summary of findings on 30 autopsies as performed by Dr. E. T. Bell of the department of pathology and studied by him, shows:

1. Aside from pneumonia only two fatal sequelae were found, one a case of generalized pulmonary oedema with bacteriemia, and one a suppurative case of streptococcic pleuritis and pericarditis. Both of the latter cases also had pneumonia.
2. Hemorrhage was a prominent feature in 23 of the 30 cases.
3. Edema was present in 20 cases, varying from a small amount in the anterior portions to extensive involvment of both lungs.
4. Interstitial pneumonia was found in three cases.
5. Cultures from the lungs in 15 cases showed pneumococci thirteen times and streptococci twice in pure culture. No influenza bacilli were found.
6. Dr. Bell states that "the pathologic evidence supports the clinical observation that the infection first develops in and around the bronchi. The coalescence of these peribronchial areas gives rise to complete lobar consolidation. The small amount of fibrin usually found also supports the interpretation of a broncho-pneumonia."

SUMMARY

1. A total of 296 cases shows 58.1 per cent of influenza, 41.8 per cent of pneumonia and a fatality on all admissions of 22.6 per cent.

2. The average febrile period of simple influenza is four days, that of pneumonia eight days.

3. Fatalities usually occur on the fourth day of the disease.

4. Blood pressures in epidemic influenza and pneumonia are lower than normal.

5. In simple influenza and many pneumonias, leucopenia is the rule, while hemoglobin, differential counts and red cells remain normal.

6. In simple influenza the urine is clear. Cases of pneumonia, however, show albumin and casts, and occasionally red blood cells.

7. Chemical studies of the blood in this disease show no nitrogen retention, but an occasional high alkaline reserve is present in fatal cases of pneumonia.

8. Blood cultures in early pneumonias are usually negative, only occasionally showing pneumococci and streptococci.

9. Sputum examinations show pneumococci and streptococci as well as occasionally the influenza bacillus.

10. "Specific" medication as used at the university hospital proved of no value. On the other hand, early confinement to bed, good nursing and free elimination appeared to be the most important measures in the treatment of influenza.

11. Pathologically, fatal cases show a massive broncho pneumonia.

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EDITORIAL

GROUP MEDICINE

The scope of the study and practice of medicine has so enormously increased that no individual can hope to keep abreast of the times in all branches or become expert in every line. The absolute necessity for real specialists is undeniable. This fact has been recognized for several decades and became apparent with the marvelous development of surgery.

Of late the specialists have multiplied incredibly and with the change certain evils have crept in. Not the least of these has been the development in most of the larger communities of pseudo-specialists, individuals without special training or experience who are preying on an uninformed public.

There is another and perhaps more insidious danger in this specialization which must be apparent to any observing individual. We are all acquainted with specialists who can be depended upon to find some abnormality in the realm of their specialty in any patient; the surgeon in the appendix, the internist in the heart, the rhinologist in the tonsils and so on ad nauseam. This rather remarkable situation is a result not always of dishonesty in a financial way but dishonesty intellectually. The specialist is too prone in looking for trouble in his field; to take the mental attitude that his special organs are guilty until proven otherwise: in other words to make a diagnosis and then by a method of deductive reasoning make the symptoms prove his diagnosis.

The value of medical consultation has long been recognized. With the development of so many specialties the organization of groups has been the natural result. Their value if rightly conducted is undeniable. Some groups are being run like a machine with apparently little brain coordination and supervision. The patient enters the mill and presto emerges with a list of diagnoses potential and definite. If suffering from an acute condition requiring immediate treatment valuable time may be lost although the diagnosis is most likely made.

Dr. Barker* in an excellent article has pointed out the great need in any group for a physician of wide experience whose function should be to correlate all the acquired information furnished by various members of a group and logically to determine the main trouble and dictate the most important line of treatment. This man he calls the integrator. Any patient applying to any member of the group is referred to the integrator who suggests the special examinations he deems indicated and finally sums up the case and advises the necessary treatment.

Only in some such way are we likely to avoid pitfalls incident to the grouping of specialists. The internist is the natural choice for integrator and there is no reason why any group should not have more than one internist associated in this capacity.

In the study of an obscure case the group has the advantage in being able to give a more rapid and more complete overhauling of the patient. Nevertheless a large percentage of patients do not want and do not require such a thorough examination. It would be as ridiculous to put a man with a cut finger through such a process and expect him to pay for it as to expect the automobile owner to have his entire machine overhauled each time he has a puncture.

Let us not overdo this thing.

*The General Diagnostic Study of the Internist. L. F. Barker, M. D., Baltimore. New York Med. Jour. Vol. 108 Nos. 12, 13, 14.

THE AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS

The tendency of the profession to require more thorough scientific attainments from those who aspire to become specialists in various departments, is well illustrated by the action of the American Board for Ophthalmic Examinations, and is a move that might well be copied by representatives of the other specialties.

Beginning in 1913 the American Opthalmological Society, the Section on Ophthalmology of the American Medical Association and the American Academy of Ophthalmology and Oto-Laryngology, all appointed committees to work together toward raising the standards of their specialty. After several years of work, the American Board for Ophthalmic Examinations was organized, consisting of nine members, three from each of the above mentioned societies.

The functions of the board are: first, to establish standards of fitness to practice ophthalmology; second, to investigate and prepare lists of medical schools, hospitals and private instructors, recognized as competent to give the required instruction in ophthalmology; third, to arrange, control and supervise examinations to test the preparation of these who desire to practice ophthalmology and to confer a certificate upon those who meet the standards established.

In the future the American Ophthalmological Society and the American Academy of Opthalmology and Oto-Laryngology will require all applicants for membership to have the certificate or its equivalent in a degree in ophthalmology from a recognized university.

The American College of Surgeons has appointed the examiners of this board as their ophthalmic credentials committee.

The board will take into consideration the professional records and years of service of applicants in their examination. These examinations will be held annually at or near the time and place of meeting of the American Medical Association. Dr. W. H. Wilder, 122 South Michigan Ave., Chicago, Illinois, is the secretary. H. L. T.

THE RETURN OF INFLUENZA

While the return of influenza was variously predicted many did not consider that the country would be afflicted to any great degree. This was argued on the ground that in contrast to the epidemic of 1889 and the early nineties such a large percentage of the population was involved in the later epidemic that all non-immunes were affected and rendered immune.

About the middle of January the reappearance of influenza began to be widely reported throughout the country. The infection, whether one prefers the English or French term, was not as widespread nor as severe as that of a year ago. Clinically there was not the accompanying initial prostration and apparently the incidence of pneumonia was not as great. A certain percentage of individuals were reafflicted this year showing either a short lived immunity or a mixed infection as the etiological factor.

Apparently the influenza epidemic which had its height in the fall of 1918 must be viewed retrospectively as of several years' duration. It would not be unreasonable to expect more than an average number of cases next year.

There are just two main bits of advice the profession can offer regarding the treatment of this infection. The first bit is expressed in the dictum "Early to bed, early to rise." The second is the advisability but not guaranteed efficacy of prophylactic vaccination.

VITAL STATISTICS FOR 1918

Unreliable as statistics as a rule are, the recent report of the United States Census Bureau for the year 1918 is of considerable interest. This Bureau's registration area includes thirty states and twenty-seven cities outside this territory and comprises 77.8 per cent of the estimated population of the United States.

Roughly speaking, the bureau has recorded nearly a million and a half deaths in the year. About half a million of these were due to influenza and pneumonias of various types, the majority occurring during the last four months of the year. It seems remarkable that the cause of death in more than half of these cases were reported as simply influenza. This one fact shows an inaccuracy in diagnosis, as the

vast majority of cases reported dying from influenza certainly suffered also from pneumonia.

Next in importance in mortality come in the order mentioned, organic diseases of the heart, tuberculosis in all forms, the various nephritides, and cancer.

It is discouraging to note that there has been a slight increase in the number of fatalities due to tubercuIosis during 1917 and 1918. Previous to this a gradual decrease had occurred since the year 1904. Tragic conditions following the World War will doubtless cause a marked increase in the prevalence of this disease so dependent on nutritional conditions. We, as a nation, are likely to share this unfortunate war penalty to at least a slight degree.

While cancer showed a slight decrease for 1918 this disease has shown a definite rise in incidence during recent years.

The remarkable decrease in the typhoid fever mortality rate from 35.9 in 1917 to 12.5 in 1918 is striking. Vaccination particularly and general improvement of hygienic conditions are probably responsible.

The automobile proved itself an expensive addition to modern life in exacting a toll of 7,525 lives. Street cars were responsible for 2,366, mines 2,497 and 5,633 individuals were drowned. The figure 9,937 for suicides was the lowest since 1903.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNEAPOLIS CLINIC WEEK

Minneapolis Clinic Week begins this year Monday, April 19th, and the program will be concluded Thursday, April 22nd.

This will be the third congress of this kind held by the Hennepin County Society. The first meeting was successful far beyond expectation. The second meeting was even more successful and it is hoped that the coming Clinic Week may eclipse the others in attendance and benefit to those present.

The program will vary somewhat from last year, clinics being given each day until 3 in the afternoon and from 4 to 6 o'clock clinical demonstrations, motion pictures and lantern talks will be presented at the Radisson Hotel.

Prospective visitors should make hotel reservations early through Dr. G. Elmer Strout, 900 Donaldson Bldg., Minneapolis.

It is planned to hold the annual banquet of the Hennepin County Society on one of the evenings of the week. Visitors are invited to be present at the banquet.

Officers of the clinical section are: Dr. A. W. Abbott, chairman; Dr. W. A. Jones, Dr. J. P. Schneider, Dr. R. E. Farr. Dr. G. Elmer Strout, secretary.

AMERICAN MEDICAL ASSOCIATION

The next meeting of this association will occur April 26 to 30, 1920, at New Orleans. Dr. H. W. E. Walther, 1216 Maison Blanche Bldg., New Orleans, chairman of the sub-committee on Transportation of the local committee on arrangements for the New Orleans session is ready to assist interested local medical organizations in cities located in the Mississippi Valley in the chartering of boats for the trip to New Orleans.

AMERICAN BOARD FOR OPTHALMIC EXAMINATIONS

The next examination by the Board will be held at New Orleans, Monday, April 26, 1920, at the time of the meeting of the American Medical Association. Candidates who wish to take the examination for the certificate of the board should make their application and send in the necessary credentials to Dr. W. H. Wilder, 25 East Washington street, Chicago, at once.

Conference on Public Health and Legislation

The midwinter conference on Public Health and Legislation will be held in Chicago, at Auditorium Hotel, March 4, 1920.

PROGRAM

Morning

Chairman's Address, Dr. Victor C. Vaughan.

Secretary's Report, Dr. Frederick R. Green.

"Standardization of Public Health Activities," Dr. George E. Vincent.

"Standardization of State Public Health Organizations", Dr. Chas. V. Chapin.

"Standardization of Municipal Health Organization," Dr. Allen McLaughlin.

Afternoon

"Health Education in the Public Schools—Thirty Years' Experience in Michigan," Dr. Victor C. Vaughan.

"Health Education and Activities in Colleges and Universities," Dr. J. Sundwall.

"Health Education a Function of Municipal Health Departments," Dr. H. Emerson.

"Health Education a Function of State Health Departments," Dr. W. S. Rankin.

"Health Education a Function of the Federal Government," Dr. Chas. V. Bolduan.

UPPER MISSISSIPPI MEDICAL SOCIETY

The meeting of the Upper Mississippi Medical Society was held at Brainerd, Minnesota, Jan. 6th, 1920. The following officers were elected: President, Dr.

J. A. Evert, Brainerd; first vice-president, Dr. F. L. Wilcox, Walker; secretary-treasurer, Dr. Irving Badeaux, Brainerd; censor, Dr. Knickerbocker, Staples; delegate to state association meeting, Dr. P. M. Hall, Walker; alternate, Dr. J. J. McKinnon, Wadena.

PARK REGION DISTRICT

The annual meeting of the Park Region District and the Otter Tail County Medical Association was held in January at Fergus Falls, Minnesota. The following officers were elected for the ensuing year. President, Dr. K. G. Lee, Underwood; vice-president, Dr. Randall, Ashby; second vice-president, Dr. Chas. W. Meckstroth, Brandon; secretary-treasurer, Dr. F. Naegeli.

SANITARIUM BOARD

The board of directors of the Tri-County sanatorium held their first annual meeting in January at Thief River Falls. The following officers were elected: President, Dr. O. F. Melby, Thief River Falls; secretary, P. O. Myhrum, Thief River Falls. Miss Karen Knutson was retained as superintendent of the hospital and Dr. M. G. Milan appointed regular physician.

WINONA COUNTY MEDICAL SOCIETY

The Winona County Medical Society at its annual meeting held Jan. 6, 1920 elected the following officers: President, Dr. C. A. Lester; vice-president, Dr. Samuel Schaefe; secretary, Dr. C. P. Robbins; treasurer, Dr. I. W. Steiner; delegate to state convention, Dr. B. P. Rosenberry; alternate, Dr. Donald B. Pritchard; member board of censors, Dr. G. J. Tweedy.

HENNEPIN COUNTY MEDICAL SOCIETY

The annual meeting of the Hennepin County Medical Society was held in the Donaldson Bldg., Minneapolis, Jan. 5, 1920. Dr. J. Frank Corbett was elected president; Dr. Angus Morrison, first vice-president; Dr. F. L. Adair, second vice-president and Dr. C. W. Petit was reelected secretary and treasurer for the coming three years. Dr. J. C. Litzenberg, the retiring president, gave an address on health insurance.

MEDICAL EDUCATION AND LICENSURE

The annual Congress of Medical Education and Licensure meets March 1, 2 and 3, 1920, at the Congress Hotel, Chicago, and is a combined meeting of the Council on Medical Education, Association of American Medical Colleges and the Federation of State Medical Boards.

PROGRAM

MONDAY, MARCH 1, 1920

MORNING SESSION, 9:30 A. M.

Introductory remarks by Dr. Arthur Dean Bevan, chairman of the Council on Medical Education, Chicago.

Dr. George Blumer, president of the Association of American Medical Colleges, New Haven, Conn.

Dr. David A. Strickler, president of the Federation of State Medical Boards, Denver, Colo.

"Present Status of Medical Education," Dr. N. P. Colwell, Chicago.

Symposium on "The Needs and Future of Medical Education," Dr. George E. Vincent, New York City.

Dr. Ray Lyman Wilbur, Stanford University, Calif.

Dr. Henry S. Pritchett, New York City.

Dr. Harry Pratt Judson, Chicago.

Mr. Abraham Flexner, New York City.

MONDAY AFTERNOON, 2 P. M.

"The Larger Function of State University Medical Schools," Dr. Walter A. Jessup, Iowa City.

"Full-Time Teachers in Clinical Departments," Dr. William Darrach, New York City.

"Research in Medical Schools, Laboratory Departments," Dr. Oskar Klotz, Pittsburgh.

"Research in Medical Schools, Clinical Departments," Dr. G. Canby Robinson, St. Louis.

TUESDAY, MARCH 2, 1920

MORNING SESSION, 9:30 A. M.

"Graduate Medical Instruction in the United States," Dr. Louis B. Wilson, Rochester, Minn.

"Interallied Medical Relations; Qualifying Examinations, Licensure, Examinations, Graduate Medical Instruction," Dr. Walter L. Bierring, Des Moines.

"Essential Improvements in State Medical Licensure," Dr. John M. Baldy, Philadelphia.

"Interstate Relations in Medical Licensure," Francis W. Shepardson, Springfield.

TUESDAY AFTERNOON, 2 P. M.

Reports on Medical Teaching from the Committee on Medical Pedagogy of the Association of American Medical Colleges.

Remarks by the chairman, Dr. W. S. Carter, dean, University of Texas Department of Medicine, Galveston.

Anatomy: Dr. Charles R. Bardeen, dean, Madison.

Histology and Embryology: Dr. F. C. Waite, Cleveland.

Physiology: Dr. E. P. Lyon, dean, Minneapolis.

Biological Chemistry: Dr. Otto Folin, Boston.

WEDNESDAY, MARCH 3, 1920

MORNING SESSION, 9:30 A. M.

Pharmacology: Dr. C. W. Edmunds, Ann Arbor.

Pathology: Dr. James Ewing, New York City.

Bacteriology and Parasitology: Dr. A. I. Kendall, Chicago.

Public Health and Preventive Medicine: Dr. Victor C. Vaughan, Ann Arbor.

WEDNESDAY AFTERNOON, 2 P. M.

Separate business meetings will be held by the Association of American Medical Colleges and the Federation of State Medical Boards. The former will meet in the Florentine Room and the latter in the Green Room.

OF GENERAL INTEREST

Dr. McAdory of New York has moved to Bemidji.

Dr. T. Thorson of Buffalo has taken a trip to Norway.

Dr. C. C. Blakely of Charles City, Iowa has located at Barnum.

Dr. R. M. Laney of Turtle River has located at Deer River.

Dr. W. V. Lindsay of Winona has been elected county physician.

Dr. Harold L. Lamb of Sauk Center has received his discharge from army service.

Dr. P. A. Lommen has located in Austin and associated himself with Drs. Hegge and Hegge.

Dr. B. A. Kamp has been discharged from army service and has again located in Albert Lea.

Dr. W. R. Humphrey of Stillwater has returned from Virginia after an absence of three months.

Dr. S. S. Shannon of Crosby has been appointed surgeon for the Northern Pacific railroad for the Cuyuna range.

Dr. D. W. Lynch announces his return from overseas service and the reopening of his diabetic sanatorium at West Bend, Wis.

Dr. H. J. Shelver of Appleton has moved to Ortonville where he will become associated with Drs. Bolsta, Karn and O'Donnell.

Dr. Harry Lowell, formerly associated with the Mayo clinic at Rochester, has been named head of the Mercy Hospital at Hamilton, Ohio.

Dr. C. D. Kolset of Benson has been appointed assistant surgeon and medical examiner for the United States Public Health service.

Dr. Joseph Neal, acting superintendent of the Minneapolis City Hospital, has resigned from the hospital staff to take up private medical practice.

Dr. John S. Abbott, St. Paul, has been appointed Deputy Health Officer to replace Dr. R. I. Hubert, who has resigned and moved to Bellflower, California.

Dr. Willard S. Howard, who was recently discharged from service has located in Dawson and will be associated with Drs. Stemsrud, Johnson and Johnson.

Dr. Harry L. Schurmeier formerly of St. Paul announces his return from Europe and resumption of the practice of medicine and surgery at Santa Barbara, Cal.

Dr. Nellie Barsness has returned from Europe, where she served as eye specialist in the Gas Hospital in the French Army, and has resumed her practice at 710 Lowry Bldg., St. Paul.

Dr. Edward Schons is equipping offices at 348 Lowry Bldg., St. Paul, for x-ray diagnosis and treatment. Following his discharge from the service, Dr. Schons studied with Dr. H. K. Pancoast of Philadelphia.

It should be of interest to physicians throughout the state to know that Dr. R. E. Farr of Minneapolis is giving local anaesthesia clinics on the second and fourth Saturdays each month at St. Mary's Hospital, Minneapolis. These clinics begin at 9 a. m and consist of clinical demonstrations and short lectures on various phases of local anaesthesia. An invitation is extended to interested physicians.

The Rockefeller Foundation has furnished four more fellowships for foreign physicians studying in America. These young men are from Czecho-Slavakia and are studying public health administration. This foundation already has eight Chinese physicians, eleven Chinese undergraduate medical students, four Chinese nurses, eleven medical missionaries on furlough from China, four physicians from Brazil and one from San Salvador, studying in America under fellowship.

The Public Health Service has undertaken an extension study of child hygiene in several localities in Missouri in connection with the newly created department of child hygiene in that state. This service will attempt to demonstrate what proper care of teeth and eyes and corrective measures for those mentally backward can do for the general development of the next generation. Glasses will be fitted, teeth looked after and suggestions made regarding the needs of the school children. Children of preschool age will be visited in the home and the work will include birth registration and even prenatal care.

Major R. R. Luce has recently assumed his dutics as Supervising Dental Surgeon for the district including Minnesota, North and South Dakota and Montana with headquarters at 1242 Lowry Bldg., St. Paul. According to the recent policy adopted at Washington ex-dental surgeons with at least three years of professional experience since graduation are being appointed in each county of the United States. These men will care for ex-soldiers who are entitled to dental care on a fee basis. In the larger cities dental clinics will be established. The only one at present is under Dr. Robb in the Lowry Bldg., St. Paul. The regulations require that an ex-soldier must first have a compensation number, that is must have filled out Form 526 and been given a number before he is entitled to authority which will be given in this district on communicating with Major Luce.

The federal income tax for the year 1919 is due March 15, 1920 and payable to the nearest located Collector of Internal Revenue. All those having an income over $1000 are required to make a return. For married men the first $2000 of the net income and for single men the first $1000 are exempt. For each child dependent $200 exemption is allowed.

In estimating net income a physician is entitled to subtract from his gross income all professional expense such as office rent, stenographer's salary,

cost of drugs and subscriptions to medical societies and journals, donations to organized charities or religious activities and contributions to educational and scientific projects. Interest on any indebtedness and taxes except those on income or excess profits are also to be deducted. A fair percentage of automobile expense and depreciation may be charged off. This percentage should be estimated on the mileage used for purely professional calls.

The so-called normal tax is 4 per cent on the first $4000 of net income above the exemption. Above this $4000 the normal tax is 8 per cent. In addition there is a surtax when the net income exceeds $5000. This is a varying rate which is 1 per cent on any net income in excess of $5000 up to $6000 and this surtax increases 1 per cent on each $2000 in excess of $6000 up to the figure $100,000.

Any physician in the state desiring the privilege of prescribing or personally using distilled spirits (alcohol, whisky, gin and wines) should write the Prohibition Director, Minneapolis, Minn., asking for application forms. One form is required in order to prescribe for patients and a second form so specifying in order to have it on hand in practice.

The physician will receive a pad of prescription blanks which are to be used in prescribing alcohol in any form. The prescription shows the physician's number in addition to the ordinary prescription make up. The amount of liquor is limited to one pint for each patient during a period of ten days. In an emergency an ordinary prescription form may be used, but the physician's permit number and the patient's name, address, etc., must be included. The filled out application for permission to use alcohol in office practice for disinfection or in emergency cases must be sent to Washington where it will be acted upon by the Federal Prohibition Commissioner. The amount so procured is limited to six quarts a year and cannot be sold. Sale of distilled spirits is limited to druggists.

Provision has been made for druggists to obtain distilled spirits using a special form. They pay the non-beverage tax of $2.20 per proof gallon which rate is determined on the actual alcoholic content. The high prices often charged by dispensing druggists on the assumption that the beverage tax of over six dollars a gallon was paid by them are therefore exorbitant.

VIENNA RELIEF

We have the authoritive statement of Herbert Hoover that "The condition in Austria is the worst in all Europe." It is authoritatively reported that 150,000 human beings died in Vienna in 1919. American war workers state that ninety per cent of the children in Vienna have rickets and that tuberculosis, always with a high mortality rate there, is mounting to still higher levels. A special cable dated December 24th in the Chicago Tribune stated that the food and fuel supply of Vienna would be exhausted by Jan. 21st unless relief appeared. Newspaper reports have been confirmed by private communications.

The medical world, particularly that of the United States, owes a debt to Vienna. During the five years preceding the war three thousand five hundred American physicians studied in Vienna. It is true they paid a fee, but the fee was nominal considering what was received.

Dr. Carl Beck of Chicago has been in communication with Prof. Lorenz and Prof. Eiselsberg of Vienna as secretary of the Vienna Relief Committee with headquarters at 1826 Conway Bldg., Chicago, Ill. Chicago is trying to raise $500,000, Milwaukee has pledged to raise $100,000, St. Louis at least $100,000 and a large number of cities are following suit. Mr. Hoover's committee estimates *three million dollars* will be necessary.

This notice appears in order to enable members of the profession to contribute through reliable channels to this urgent call to save human lives from starvation.

Many physicians throughout the state have acquaintances, others have friends who may be suffering in Vienna. In spite of the pressing demands at home are there any quite as important as this elementary plea for food?

NEW AND MORE LIBERAL BENEFITS FOR EX-SERVICE MEN

EFFECTIVE DECEMBER 24, 1919

Under the new Amendment to the War Risk Insurance Act, which has been passed by Congress and which became a law on December 24, 1919, when it was signed by the President, war term insurance or United States Government life (converted) insurance policies may be made payable to any of the following list of beneficiaries:

Parent, grandparent, stepparent, parent through adoption, wife or husband, child, grandchild, stepchild, adopted child, brother, sister, half-brother, half-sister, brother through adoption, sister through adoption, stepbrother, stepsister, uncle, aunt, nephew, niece, brother-in-law, sister-in-law, a person who has stood in the relation of a parent to the insured for a period of one year or more prior to the insured's enlistment or induction, the children of such person; parent, grandparent, stepparent or parent through adoption of the insured's wife or husband.

United States Government life (converted) insurance may now be paid at death in a lump sum or in installments for 36 months or more, at the option of the insured.

The rate of compensation for disability has been greatly increased. A comparison between the amounts formerly granted under the War Risk Insurance Act with those provided by the new law follows:

Temporary Total Disability	W.R.I.Act	As Amended
With neither wife nor child....	$30	$ 80
With wife but no child.....	$45	$ 90
With wife and one child.....	$55	$ 95

With wife and two children....	$65	$100
With wife and three or more children	$75	$100
With no wife but one child....	$40	$ 90
With no wife but two children.	$50	$ 95
With no wife but three children	$60	$100
*With no wife but four children	$60	$105
Extra allowance for dependent mother or dependent father or both	$10 each	$ 10 each

*Under the new law there is an allowance to a man temporarily totally disabled, and with no wife living, of $5 additional for each child (in excess of one) without limit as to number.

NEW AND NON-OFFICIAL REMEDIES

During January the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion with New and Nonofficial Remedies:

Gilliland Laboratories:
- **Pasteur Anti-Rabic Vaccine-Gilliland.**
- **Pneumococcus Vaccine Immunizing-Gilliland.**

Eli Lilly and Company:
- **Chloroxyl.**

Parmele Pharmacal Company:
- **Chinosol and Chinosol Tablets.**

E. R. Squibb and Sons:
- **Thromboplastin Hypodermic-Squibb.**

Winthrop Chemical Company, Inc.:
- **Veronal-Sodium.**

Ichthyol.—An aqueous solution, the important medicinal constituents of which are ammonium compounds containing sulphur in the form of sulphonates, sulphones and sulphides. These products result from the sulphonation of the tarlike distillate obtained from the bituminous shales found near Seefeld in the Tyrol. Ichthyol is weakly antiseptic and mildly irritant. It is used locally on the supposition that it will secure the absorption of swellings and effusions in contusions, burns, etc., and especially in gynecologic practice and in various skin diseases. Ichthyol has been tried internally in a great variety of conditions, but its therapeutic value in many of its suggested applications has not been fully established. Merck and Co., New York (Jour. A. M. A., Jan. 3, 1920, p. 30.)

Veronal-Sodium.—A brand of barbital sodium complying with the N. N. R. standards. For a discussion of the actions and uses of barbital sodium, see New and Nonofficial Remedies, 1919, p. 83. The Winthrop Chemical Company, Inc., New York.

Procaine-Calco.—A brand of procaine complying with the N. N. R. standards. For a discussion of the actions and uses of procaine, see New and Nonofficial Remedies, 1919, p. 30. The Calco Chemical Company, Boundbrook, N. J.

Typhoid-Paratyphoid Bacterin (Special Bacterial Vaccine No. 13.)—Marketed in 5 Cc. vials, each cubic centimeter containing 1,000 million killed B. typhosus, 750 million killed B. paratyphosus "A" and 750 million killed B. paratyphosus "B". For a discussion of typhoid vaccine, see New and Nonofficial Remedies, 1919, p. 292. E. R. Squibb and Sons, New York (Jour. A. N. A., Jan. 3, 1920, p. 31.)

Mercurochrome-220.—A preliminary report of the Council on Pharmacy and Chemistry discusses the experimental status of this new germicide for use in the genito-urinary tract. While the lack of confirmatory evidence of its value does not permit more than a tentative acceptance, the available data may be sufficient to warrant its use by physicians, provided its experimental therapeutic status is recognized. Mercurochrome-220 (marketed by Hynson, Westcott and Dunning, Baltimore) is stated to be dibromo-oxymercury fluorescein. It is a red powder, insoluble in water but soluble in alkalis. According to Young, White and Swartz. Mercurochrome-220 is a strong and rapidly acting germicide which penetrates the tissues readily and is tolerated in 1 per cent solutions by the bladder, renal pelvis and urethra. Only temporary discomfort is caused when a 2.5 per cent solution is applied to the anterior urethra. Its toxicity is high, but no systemic effects have been observed following its local application (Jour. A. M. A., Jan. 3, 1920, p. 31.)

Chinosol.—Oxyquinolin Sulphate.—Chinosol is a powerful, nontoxic antiseptic, somewhat stronger than mercuric chloride and considerably stronger than phenol. It is a feeble germicide, being weaker than phenol and much weaker than mercuric chloride. Chinosol is claimed to have marked analgesic power and to be an efficient deodorant. Chinosol is also marketed in the form of chinosol tablets 0.25 Gm. Parmele Pharmacal Company, New York.

Dubois' Iodoleine.—Iodized poppyseed oil. An iodine addition product of poppyseed oil. Dubois' Iodoleine may be used whenever iodides are indicated, its effects being more gradually exerted. It is supplied as Dubois' iodoleine capsules 0.25 Cc., equivalent to 0.1 Gm. iodine, Dubois' iodoleine injectable, containing 30 per cent iodine, and Dubois' iodoleine injectable ampules, equivalent to 0.3 Gm. iodine. David B. Levy, New York (Jour. A. M. A., Jan. 10, 1920, p. 104.)

Thyroxin.—4, 5, 6-trihydro- 4, 5, 6-triiodo-alpha-oxy-beta-indole proprionic acid. An active principle obtained from the thyroid gland. Thyroxin is used essentially for the same purposes as Dried Thyroids, U. S. P. It is indicated in some cases of diminishing or absent thyroid functioning, such as simple goiter, cretinism or myxedema.. Thyroxin is supplied only in the form of tablets for oral administration, containing, respectively, 0.2, 0.4, 0.8 and 2 Mg. of thyroxin. E. R. Squibb and Sons, New York.

Thromboplastin Hypodermic-Squibb.—A sterilized extract of cattle brain in physiological solution of sodium chloride. It complies with the description of thromboplastin-Squibb, but a longer time is required for the clotting of blood plasma. It is intended for hypodermic and intramuscular injection to increase

the coagulability of the blood. E. R. Squibb and Sons, New York (Jour. A. M. A., Jan. 10, 1920, p. 105.)

Names for Phenolphthalein.—The following is a partial list of names under which phenolphthalein and phenolphthalein preparations and combinations are or were advertised: Alophen, Cholelith, Pills, Elzernac, Ex Lax, Exurgine, Laxophen, Laxine, Laxirconfect, Laxothalen Tablets, Paraphthalein, Phenalein, Phenolax Wafers, Phenolphthalein Laxative, Probilin, Prunoids, Purgatol, Purgen Konfect, Purgella, Purglets, Purgo, Purgolade, Purgotin, Purgylum, Phuphen, Thalosen, Veracolate, Zam Zam. What a Babeldom would arise in medical practice if this business policy of manufacturers to present their products by coined names were encouraged by the patronage of physicians. Self-respecting manufacturers owe it to the progress of medical science to do away wiith such camouflage for revenue only and the medical profession owes recognition to these manufacturers by prescribing products by their scientific names (Jour. A. M. A., Jan. 3, 1920, p. 29).

"Antipneumococcic Oil" and Camphor in Pneumonia.—The Council on Pharmacy and Chemistry reports that "Antipneumococcic Oil" (a solution of camphor in oil, sold by Eimer and Amend, New York) is ineligible for New and Nonofficial Remedies because (1) the recommendations for its use in pneumonia are not warranted by the evidence; (2) the name is not descriptive of the composition, but therapeutically suggestive; and (3) the sale of a solution of camphor in oil under a name non-descriptive of its composition is unscientific and a hindrance to therapeutic progress (Jour. A. M. A., Jan. 3, 1920, p. 46.)

More Misbrandings.—George L. King, Kingfisher, Oklahoma, was prosecuted by the federal authorities because the therapeutic claims for "King's Kidney Remedy" were false and fraudulent. The United States Drug Manufacturing Company, Philadelphia, was prosecuted by the federal authorities because a number of its tablets were found not to contain the amount of drug claimed. The John H. Casey Medical Company, Hillyard, Washington, was prosecuted by the federal authorities because "Casey's Rheumatic Cure—The Great Montana Remedy" was sold under false claims of composition and of therapeutic properties. Joseph McManus, doing business under the name of Philadelphia Capsule Co., Philadelphia, was prosecuted by the federal authorities because some of the products sold were misbranded, or adulterated, or both (Jour. A. M. A., Jan. 10, 1920, p. 121.)

Singleton's Eye Ointment.—This is a British nostrum. The chemists of the British Medical Association in 1909 reported it to be principally a mixture of lard and Japan wax and purified cocoanut oil, with 4 per cent of beeswax and 7.4 per cent of red mercuric oxid. (Jour. A. M. A., Jan. 17, 1920, p. 193).

Kline's Nerve Restorative.—In 1915, the A. M. A. Chemical Laboratory reported, of this alleged epilepsy remedy, that essentially each 100 Cc. of the solution contained approximately 8.7 gm. ammonium bromid, 9.2 gm. potassium bromid and 8.0 gm sodium bromid. Calculated from the bromid deterina tion, each mealtime dose contained the equivalent of 17.2 grains of potassium bromid (Jour. A. M. A., Jan. 17, 1920, p. 193.)

Apothesine.—This is an efficient local anesthetic manufactured by Parke, Davis and Co. It belongs to the procain rather than to the cocain type, that is, while efficient for injection anesthesia, it is relatively inefficient when applied to mucous membranes. The Council on Pharmacy and Chemistry reports that exception was taken to certain claims of efficiency, safety, etc., and that it sent these objections to Parke, Davis and Co. The firm apparently was unwilling or unable to submit evidence for the claims that had been questioned, nor did it offer to modify the claims themselves. Apothesine is, therefore, ineligible for inclusion in New and Nonofficial Remedies. It will, however, be listed in the "Described But Not Accepted" Department of New and Nonofficial Remedies (Jour. A. M. A., Jan. 24, 1920, p. 265.)

Dial "Ciba".—This is a hypnotic sold by A. Klipstein and Co., Inc. Chemically, it is closely related to barbital (veronal). The Council on Pharmacy and Chemistry reports that it has not been accepted for New and Nonofficial Remedies because unwarranted claims are made for the product. As it might be made eligible for N. N. R. if the misleading therapeutic claims were eliminated, the Council directed that Dial "Ciba" be included with articles "Described But Not Accepted" so that physicians might be informed with regard to its character and properties (Jour. A. M. A., Jan. 24, 1920, p. 266.)

Vleminckx' Solution.—This solution, used by Dr. W. A. Pusey for verrucae, is a solution of oxysulphuret of calcium. It is in the National Formulary as Liquor Calcis Sulphuratae and is made by boiling together water, lime and sulphur (Jour. A. M. A., Jan. 24, 1920, p. 268.

Skeen's Stricture Cure.—For some years, a concern in Cincinnatti which has gone under the name "D. A. Skeen" and "The D. A. Skeen Co." has advertised a mail order treatment that was "guaranteed" to cure stricture or enlarged prostate. Now the postal authorities have denied the use of the U. S. mails to this concern and its manager, George B. Poole. The product was found to be essentially a solution of ferric chlorid in alcohol and water (Jour. A. M. A., Jan. 31, 1920, p. 340.)

Pneumo-Strep-Serum.—In an advertisement of Pneumo-Strep Serum, the Mulford Company, by going beyond our present knowledge, carries misleading inferences. If the "Pneumo-Strep-Serum" had the virtues with which the advertisement inferentially endows it, this product would have been accepted by the Council on Pharmacy and Chemistry for in-

clusion in New and Nonofficial Remedies. It has not been so accepted, although many other biologic products of the same manufacturer have been (Jour. A. M. A., Jan. 31, 1920, p. 342.)

OBITUARY

DR. E. S. SOUTHARD

A keen sense of loss was felt by many members of the profession at the news of the death last month of Dr. E. S. Southard of Boston. Dr. Southard delivered lectures before the Society of Neurology of New York and the Association of Mental Hygiene at the New York Academy of Medicine, February 1st and 2nd, and was smitten with pneumonia the following day.

Dr. Southard was an assistant professor of psychology at Harvard University and professor of neuropathology at the Harvard Medical School. He was very active in his chosen field of psychiatry. Since 1912 he had been director of the Boston Psychopathic Hospital and at the time of his death was a director of the Massachusetts Psychiatric Institution. He was an assistant editor of the Journal of Nervous and Mental Diseases, the Psychiatric Bulletin and the Journal of Clinical and Laboratory Medicine. Among his books were "Neurosyphilis" written in collaboration with Dr. H. V. Solomon; "Shell-Shock and Neuropsychiarty" and the "Weekly Research Papers," which were written in collaboration with Dr. H. E. Fernold. During the war he was a major in the Chemical Warfare Service and also chairman of the committee on Psychiatry and Neurology of the National Research Council.

Dr. Southard's particular hobby was chess, and he ranked among the foremost amateur players of the country. He was especially interested in the case of Harry N. Pillsbury, the former American champion chess player who in his later years lost his mind. The doctor made an examination and study of his brain in an attempt to throw light on the mooted question whether a genius for chess tends to deteriorate the mind.

In 1906 Dr. Southard married Dr. Mabel Fletcher Austin of Boston, a John Hopkins Medical School graduate and sister of Helen and H. W. Austin of St. Paul.

CORRESPONDENCE

PHARMACOPOEIAL CONVENTION, MAY 11, 1920

In harmony with the requirements of the By-Laws, attention of interested parties is called to the meeting of the Tenth Decennial Pharmacopoeial Convention of the United States, to be held beginning at 10:00 a. m., May 11, 1920, at the Willard Hotel, Washington, D. C. All incorporated bodies and other institutions entitled to membership in this Convention are entitled to at once apply to Dr. Noble P. Barnes, Arlington Hotel, Washington, D. C., for the necessary blanks for membership in the Convention.

Prior to the meeting of the Convention the Committee on Credentials will meet in Washington to consider all applications which are made. It is important, therefore, that all applications for membership should be in the hands of Dr. Barnes at least six weeks before the date of the meeting. It will be difficult to consider, properly, credentials which are delayed beyond that date and especially those which may be presented at the time of meeting.

Sincerely,

B. H. W. Wiley,
President, 9th Decennial Pharmacopoeial Convention of the United States.

PROGRESS IN MEDICINE AND SURGERY

AGE DISTRIBUTION AND AGE INCIDENCE IN 500 CASES OF CANCER OF THE UTERUS. Reuben Peterson, M.D., F.A.C.S., Ann Arbor, Mich.; (Surg. Gyn. and Obst. Vol. 29, No. 6.) says, "Interest in the age incidence of carcinoma of the uterus was aroused by a recent case of this disease observed in the Gynecologic Clinic of the University Hospital in a young married woman 21 years old. 500 cases of uterine carcinoma were selected which had had the diagnosis confirmed microscopically in the University of Michigan Pathological Laboratory by its director. The following headings have been chosen for either anatomical or microscopical reasons:

"1. Carcinoma of the uterus;
2. Carcinoma of the cervix;
3. Carcinoma of the fundus;
4. Squamous cell of carcinoma of the cervix;
5. Adenocarcinoma of the cervix."

Among his conclusions he notes,

"1. The maximum age distribution in 500 cases of cancer of the uterus is at the age period 40 to 45.

"2. The young female is not immune to cancer, since 7 of 500 cases, or 1.4 per cent, occurred between the ages of 20 and 25.

"3. From the analysis of this series and from the statistics of other writers it is fair to assume that from 10 to 15 per cent of uterine carcinoma is located in the fundus." George Earl.

FUNCTIONAL DIAGNOSIS OF POLYGLANDULAR DISEASE IN ACROMEGALY AND OTHER DISTURBANCES OF THE HYPOPHYSIS. Howard (Am. Jour. Med. Sc., Dec. 1919), briefly reports six cases of hypophyseal disease, three of acromegaly, two of dystrophia adiposogenitalis and one of sarcoma of the occipito-parietal lobe with flattening of the hypophysis due to greatly increased intracranial pressure.

Determination of the sugar tolerance is the most accurate method to estimate the activity of the internal secretion of the hypophysis, thyroid gland and pancreas. The pars intermedia of the hypophysis is

directly concerned in carbohydrate metabolism; hypertrophy of it causes polyuria and a diminished carbohydrate tolerance; hypoplasia or degeneration of it results in a high degree of sugar tolerance. Therefore, in early acromegaly, we would find decreased sugar tolerance (in two cases of acromegaly of author) and in the later stages of hypophyseal disease when the pars intermedia has been destroyed by pressure or invasion, we would expect increased sugar tolerance. The author applied the usual method of sugar tolerance determination to his cases. He describes other tests to determine the function of the adrenals, etc.

Csepai has called attention to the experiment, that if three drops of a 1 to 1000 solution of adrenalin be dropped into the eye, slight or moderate blanching of the conjunctival sac will appear in a few minutes and will persist for ten to twenty minutes. Exaggeration and prolongation of the reaction indicate a diminished function of the adrenal glands. According to Csepai, a positive reaction (prolonged blanching) was associated with an increased carbohydrate tolerance. This relationship did not hold in the author's series. He further calls attention to the subcutaneous adrenalin test. Csepai found an increase of 30 to 60 mm. in the systolic pressure in normal cases after a subcutaneous injection of 5 mg. of adrenalin. This increase was not observed in one case of acromegaly, in one case of dystrophia adiposogenitalis and in one case of myxoedema, in all of which the conjunctival reaction was prolonged. The author could not confirm these findings in his series.

Falta has shown that subcutaneous administration of adrenalin in normal individuals produces a distinct leucocytosis with an increase of the neutrophiles. According to Csepai this does not occur in hypophyseal cases and therefore any variation from the normal lucocytosis indicates disease of the ductless glands. This test was of no value to the author in his series. He further describes the conjunctival pituitrin test and the subcutaneous pituitrin test neither of which helped him in the study of his cases.

In his summary, the author states that the subcutaneous adrenalin test and both of the pituitrin tests are of no value in determining the functional activity of the hypophysis, but that the adrenalin conjunctical test may help to demonstrate a hypofunction of the chromaffin system. A decrease in sugar tolerance combined with other symptoms of pituitary disturbance is indicative of increased activity of the pars intermedia. Internal administration of the pituitary extract of the whole gland or of the anterior or posterior lobe exert no influence upon the symptomatology of the disease.

E. M. Hammes.

AN OPERATION FOR PERMANENT CORRECTION OF WEAK FEET IN CHILDREN. By C. Ogilvy, 1919-1-343. Journal of Orthopedic Surgery. Children suffering from weak feet walk with an abnormal eversion. The usual correction is obtained by inverting the feet and keeping them in this position through the aid of metal arches or the thickening of the inner edge of the shoes, heel and toe.

Many cases, even after being treated in this manner for years, still have marked deformity. The author finds in these cases that the joint of the greatest deformity and relaxation is in the astragalonavicular joint.

This joint is a ball and socket joint upon which the fore foot pronates and when the toes are turned out, the strain is increased upon the ligament as well as upon the joint, as the head of the astragalus rotates down and inward.

The object of the operation is to overcome this special deformity of the astragalo-navicular joint and consists of an arthrodesis of the point with the foot held in over-corrected position by means of plaster for some weeks. He advocates the continuance of the shoe with inner edge thickened for some months after the plaster has been removed and does the operation only in children over eight years of age.

C. C. Chatterton.

SCAR-TISSUE TUMORS OCCURRING ON THE MUCOUS MEMBRANE OF THE LOWER LIP. Bloodgood (Surgery, Gynecology and Obstetrics, Vol. xxix, No. 4) states that we are all familiar with the ordinary keloid that may form in any scar, whether the wound heals by first intention or by granulation. We know that this keloid is observed more frequently in the colored race and in children of the white race, and is perhaps more frequent in females of the white race than in the males. Microscopically this keloid growth is composed largely of spindle cells and fibroblasts; very cellular areas are not conspicuous. It is covered with epidermis in which the papillary epithelial body is small, and there are no hair follicles or glands. The thin epidermal covering of the subepidermal scar rarely ulcerates unless subjected to trauma. Then a chronic ulcer developes which is very slow in healing. In cases of this kind the microscopic section shows a surface of cellular granulation tissue. Although theoretically one would expect the development of sarcoma in such an area, or carcinoma when there is an ulcer, the author has observed neither.

The scar tumor Bloodgood calls attention to is one that is frequently diagnosed clinically and often pathologically, recurrent carcinoma. This tumor occurs on the mucous membrane of the lower lip. The patients give a history of the removal of a small mucous membrane, or subepidermal tumor. The growth has been removed either with the knife or some caustic. Now, when an induration appears in the scar which has the feel of a recurrent carcinoma, there is a second operation, but the scar-tissue tumor always returns. Bloodgood's observations demonstrate that this is a keloid growth, and the best results are obtained when it is left alone.

In considering the scar-tissue tumors of the

mucus membrane of the lower lip, the following evidence is helpful. Primary carcinoma of the mucous membrane of the lower lip is rare. The position of the onset of carcinoma of the lower lip is usually at the muco-cutaneous border. When this local lesion is excised as a V-shaped piece of tissue and the wound closed the author has never observed the keloid or scar-tissue tumor appear. Several cases, with illustrations, are discussed by the author.

E. M. Jones.

EYE SYMPTOMS IN PSEUDOTUMOR CEREBRI: Report of an Additional observation. W. Lutz, Havana Cuba (Archieves of Neurology and Psychiatry, Nov. 1919, Vol. 2, No. 5.) reports a case of a woman suddenly taken ill without temperature or symtoms of an infective meningitis, but presenting all the symptoms of a brain tumor namely choked disc, headache, vertigo and vomiting, they remained severe for 14 days slowly improving toward recovery, so much so that at the end of four weeks the patient felt normal. But two years thereafter a unilateral deafness developed, followed one year later by unilateral loss of vestibular function and intermittent periods of alternations in the left cerebello pontine angle. There was no unilateral Romberg sign. Pseudo-tumor can be diagnosed only by necropsy. The author states that he does not believe it to be a case of benign tumor of the cerebellopontino angle but that of a pseudo-tumor, for the following reasons. Sudden onset of disease, retrocession of symptoms within a short time, clearing up of the choked disc, negative reaction of the cerebrospinal fluid with increase of its quantity, the unilateral deafness did not appear as a first symptom, absence of progressive paralysis of other cranial nerves, increase in patients weight and the length of time elapsed since first attack.

George C. Dittman.

THE TRANSPLANTATION OF THE RECTUS MUSCLE OR ITS SHEATH FOR THE CURE OF INGUINAL HERNIA WHEN THE CONJOINED TENDON IS OBLITERATED. THE TRANSPLANTATION OF THE SARTORIUS MUSCLE FOR THE CURE OF RECURRENT HERNIA WHEN POUPART'S LIGAMENT HAS BEEN DESTROYED: Joseph Colt Bloodgood, M. D., (Annals of Surgery, Vol. LXX. No. 1, July, 1919.) says that the chief cause of recurrence in the lower angle of the wound was due to the fact that, whether the hernia was direct or indirect—the conjoined tendon was either weak or obliterated, and that the ordinary suture or closure of the defect in the abdominal wall was not sufficiently strong to protect from recurrence in the lower angle.

During the recent war he had an opportunity to examine in Maryland a large number of selected service men who were placed in Group B because of inguinal hernia. The conjoined tendon was obliterated in 5 per cent. As the majority of these selective service men volunteered to be cured of their defect in order to render service, he had an opportunity in a few months to operate on more than one hundred cases.

In this type of hernia, when one invaginates the scrotum and introduces the finger into the external ring, little or no resistance is met and the finger passes over the public bone, and, as a rule, can be pushed into the space of Retzius behind the rectus muscle. When this anatomical defect is present on both sides the two fingers meet behind the recti.

The weakness in the abdominal wall is therefore bounded laterally by Poupart's ligament and the rectus muscle, and below by the pubic bone. The firm and perfect closure of this opening is hampered by the presence of the cord.

The author says, "When I first transplanted the rectus in order to suture it to Poupart's ligament and thus strengthen the defect in the lower angle of the wound due to the obliteration of the conjoined tendon, I also transplanted the cord and excised the veins as in the Halsted operation (Fig. 2). Since my publication in 1899 we discontinued to transplant the cord and rarely excised the veins, and when this rarer type of inguinal hernia presented itself, we continued the method of transplantation of the rectus, usually with Halsted's modification of transplantation of its sheath (Fig. 3), but we did not transplant the cord. As far as I am able to ascertain, in the group in which I had transplanted the cord (Fig. 2) there has been only one recurrence, but since the change in technic of leaving the cord undisturbed in the lower angle of the wound, I know of at least four recurrences in operations which I performed myself, and it seems strange that this made no impression."

In conclusion he makes a plea for change in the technic of the usual procedure, when there is every evidence that the chief weakness is in the lower angle of the inguinal canal due to the obliteration of the conjoined tendon, and not in the usual position, in the upper angle where the cord is situated, and through which the testicle descended.

George Earl.

TUBERCULIN IN DIAGNOSIS AND TREATMENT OF EYE DISEASES: E. Torok. (Arch. of Opthal., Vol. 48, p. 242.) Because there is tuberculosis somewhere in the body it does not follow that the eye condition is of the same origin. The demonstration of the tubercle bacillus is but rarely possible and the microscopic examination of excised diseased tissue is feasible only in some anterior affections. From a practical standpoint, the most important factors in making the diagnosis of a tuberculous affection of the eye are the clinical appearance of the eye and the tuberculin injections. Tuberculous affections are characterized by their chronic course, low inflammatory symptoms, and the appearance of small nodules (tubercles) in the affected tissues. The latter are of the greatest importance, their presence

being almost positive proof of a tuberculous affection.

To confirm the diagnosis the resort is made to tuberculin. The Calmette reaction is mentioned only to be condemned; the von Pirquet test has its limitations and when positive gives no clew to the location of the tuberculous focus in the body.

The subcutaneous test is the most reliable. For this Torok gives ½ mgm., 1 mgm. and 3 mgm. in children, and 1 mgm., 3 mgm. and 5 mgm. in adults. A local or general reaction simply means a focus exists somewhere in the body. The local reaction is the most important and is the one which indicates that the tuberculous focus is in the eye. In those cases in which a local and general reaction is observed, the diagnosis of tuberculosis cannot be positively established. In such cases in which all other causes can be excluded, it is justifiable to consider the eye condition as of probable tuberculous origin. Torok gives a resume of 100 cases diagnosed and treated as tuberculous eye affections.

One of the outstanding facts was the length of treatment necessary, in many cases lasting a number of years. Another point was that the cases, not responding to treatment generally, did not show a focal reaction.

This was particularly true of exudative choroiditis. Of eight such cases with no focal reaction, 5 had dental infection and all recovered under appropriate treatment. All of the periphlebitis retinae cases showed a focal reaction and all recovered under tuberculin therapy. In a number of cases of sclerities and sclerosing keratitis not responding to tuberculin treatment, improvement was obtained by subconjunctival injections of guaiacol cacodylate as recommended by Darier. It was thought worthwhile to further consider this agent and to investigate its healing qualities in stubborn tuberculous eye conditions. Tuberculin injections are commenced with a 1/10,000 mgm. dose and gradually increased, dependent on the condition and the reaction of the patient, to a maximum of 1 mgm. All general reactions are avoided. The frequency of the injections is regulated partly by the amount given and partly by the action of the tuberculin upon the patient, of necessity varying with the individual. As a general rule Torok gives two injections a week until 1/1000 mgm. is reached; once a week up to 1/100 mgm.; once in two weeks up to 1/10 mgm. and once a month up to 1 mgm. No hard and fast rules can be laid down as to the length of treatment being again dependent on the individual. It is a matter of years, however, and not months. After apparent cure it is well to give an injection every 3 or 4 months, for years. The following conclusions were reached:

We consider an eye condition tuberculous only when a positive focal reaction has been observed.

In cases where, for some reason or other a positive focal reaction cannot be obtained, but the patient shows a positive general and local reaction, and every other possible cause for the eye condition is, with reasonable certainty, excluded, we consider the case of probable tuberculous origin.

For diagnostic and therapeutic purposes, tuberculin should always be used in fresh solution, not over two weeks old.

For diagnosis in eye conditions, only the subcutaneous injection is of value. It can be used in children as well as in adults with practically no danger.

Tuberculin is a valuable remedy in ophthalmic therapeutics provided it is used in very small doses, in positive tuberculous eye affections, i.e. in eye affections where a positive focal reaction was obtained. Used under these conditions, there is no danger involved.

The treatment should be started with a very small dose—1/10,000 mgm., increasing it slowly to the maximum dose that the patient can tolerate, which in no case should exceed 1 mgm. During treatment all reaction should be avoided.

Duration of treatment should be long. Relapses being frequent in those cases where treatment has been discontinued after an apparent cure following treatment of less than eight months.

Best results have been obtained in those cases where treatment was continued for several years, and in which after the apparent cure, an injection of the maximum dose was given once every three or four months.

Tuberculin is of least value in chronic uveitis cases, with the exception of heterochromic cyclitis; while in the cases of scleritis and periphlebitis retinae the tuberculin treatment is most satisfactory.

Scleritis, deep and interstitial keratitis, and iridocyclitis are closely related to each other and have not a separate entity, but may change from one condition to the other, a clinical observation which is borne out by the pathologic findings of Treacher Collins.

Exudative choriditis cases are seldom of tuberculous origin, the source of infection often being the teeth.

CARL L. LARSEN.

CAUSES OF BLINDNESS IN EGYPT: A. F. Mac Callan (Amer. Jour. of Ophth., Vol. 2, No. 10, Oct. 1919.) during the year of 1918 examined, together with his co-workers nearly nine thousand patients who were blind in one eye and more than four thousand who were blind in both eyes. In the Egyptian Ophthalmic Hospitals where these examinations were carried on the definition for blindness is the inability to count fingers held at more than one metre.

The prevalence of blindness in this locality at different ages is not without interest. In the cases reported in which blindness of one eye obtained are proportioned as follows: under one year of age, one and one-half per cent; from one to five years, three and one-quarter per cent; from six to ten years, four

and one quarter per cent; from eleven to fifteen years, five and one-half per cent; from sixteen to twenty, six per cent; from twenty-one to forty years, forty and one-half per cent; over forty, thirty-eight and one-half per cent.

The inference to be drawn from the above statistics is that blindness increases progressively from birth onwards.

The causes for blindness in the reported cases were largely the result of conjunctivitis (73.39 per cent) ending in total corneal opacity, shrunken globe, secondary glaucoma and various other sequelae not specified in the statistics. Acute conjunctivitis was, in the large proportion of cases the exciting cause for trachoma, as in well known, is a chronic disease and of itself seldom produces blindness. Of the reported blind, 10.96 per cent became so through glaucoma and it may be further added that one and one-half per cent of all patients that seek treatment at the Egyptian Hospital for diseased eye conditions are blind from glaucoma.

PAUL D. BERRISFORD.

A REVIEW OF THE EFFECTS OF GUNSHOT WOUNDS OF THE HEAD: Frazier and Ingham (Arch. Neur. and Psych., Vol. 3 No. 1.) report observations made in a series of 200 cases of wounds of the head at U. S. A. General Hospital at Cape May, N. J. 163 of these patients had cranial defects, 13 had cranial fractures and 24 no evidence of cranial injury. The injuries were produced mostly by bullets and high explosive fragments. Among the early important general symptoms, were disturbance of consciousness, amnesia, delirum, confusion, choked disc, slow pulse, headache and vertigo. Out of 132 cases, 110 became unconscious immediately following the injury for a period of a few minutes to several weeks. Out of the remaining 22, who did not become unconscious, 15 exhibited permanent focal brain symptoms. In the group of cases (72) who were unconscious from a few minutes to 24 hours, concussion was probably the immediate cause of unconsciousness. In the remaining cases (38), where unconsciousness was prolonged, hemorrhage, oedema and infection were important additional factors. Amnesia of a retrograde type was present in practically all cases. Among the late general symptoms were impaired memory, indifference, depression, inability to concentrate, irritability, headaches. Complete recovery was frequent, in from three to nine months, where gross damage to the brain was absent. The main causes producing residual general cerebral symptoms were loss of cerebral tissue, injury to the brain, injury to the brain without destruction of tissue, cranial defects, scars, psychoneurosis. Frequently focal symptoms disappeared completely within one or two months following the injury. In these cases, the injury was not sufficiently marked to produce brain tissue destruction. Twenty-four cases gave a history of hemiplegia, which later disappeared entirely. Of the 200 cases, sixty suffered permanent motor symptoms of cerebral origin. However, in most instances the paralysis improved decidedly and complete paralysis of a limb was never permanent.

The functions of motility most disturbed were those of highly specialized and intricate character. Thirty-eight patients had permanent impairment of some of the forms of sensibility. Only twenty-eight patients of the entire series had convulsions while in the hospital, three of which gave a history of epilepsy prior to the injury. Two patients died—one from a temporo-parietal abscess and the other one from internal hydrocephalus and pneumonia.

Patients with hemiplegia, etc., received daily massage, muscle training, electricity and exercises. The advisability of surgical interference in these cases is fully discussed. The authors prefer the use of a bone transplant to repair cranial defects. In their summary, they speak of conditions under which operation is not recommended:

1—For the repair of small defects.

2—For the repair of defects in which the brain is adequately protected by a dense cicatrization and there is no protrusion when the patient stoops.

3—For the treatment of cerebral hernia.

4—For the relief of epilepsy except under the conditions previously noted.

5—When there are any grounds for suspecting an abscess or when there are foreign bodies which may require removal.

Conditions under which operation is recommended:

1—For cosmetic reasons, especially when the defect is in the frontal region below the hair line. There are many of these.

2—In certain selected cases of epilepsy.

3—In the presence of a large defect where the brain is exposed to trauma.

4—When the patient is apprehensive, because of the defect and he dreads the possibility of a direct blow on the uncovered cortex.

5—In a few cases where the symptoms are wholly subjective, an operation is advisable in the hope that, combined with the influence of suggestion, the neurosis will be relieved.

E. M. HAMMES.

BACTERIOLOGY OF THROAT CARRIERS OF STREPTOCOCCUS HEMOLYTICUS: Henry J. Nichols, M. D. (An. of Ot., Rh. and Lar., June, 1919, Vol. 28, No. 2.) In the discussion of a subject so vast as this the prevention of epidemics must be entirely based upon the carrier problem. Some of these organisms found in carriers are pathogenic, others are saprophytic but until they are differentiated all must be considered dangerous.

The term streptococcus hemolyticus is not a specific biologic species but simply means a hemolyzing streptococci and for clinical purposes the term is synonymous with streptococcus pyogenes. The

property of hemolysis in streptococcus cases seems to be a metabolic activity having no clinical equivalent. A similar anemia occurs with pneumococcus infection.

For the detection of carriers the specimen of the flora of the throat is obtained by passing a sterile swab over the fauces and posterior wall of the pharynx. Crypts of the tonsils are the most frequent habitat of the hemolytic streptococcus based upon the following. 1. Cultures from the surfaces of the tonsils are postive more frequently and more strongly than cultures from any other area of the nasopharynx. 2. Crypt cultures in vivo are positive in higher percentage of cases than surface cultures. 3. Crypt cultures of excised tonsils are positive in a high percentage. 4. Excision of the tonsil is the surest way of curing carriers.

In a series of fifty normal cases examined at the Walter Reed Hospital 28 per cent were positive with ordinary throat cultures and 50 positive by crypt culture.

The procedure for examination is, first, inoculation in blood agar with subculture of the original hemolysing colonies in plain broth for further identification by means of morphology and a second hemolysis test. This requires 48 hours. The streptoccus seem to form a similar group of organism according to the procedures of bacteriology. The difference in morphology is of small significance in differentiation; likewise is the degree of hemolysis. Virulence tests are made by injecting different quantities of broth culture in rabbits, mice or rats. The virulence can be raised by animal passage. (Note—No doubt the extreme virulence encountered in 1918 and 1919 was due to the passage of various strains from man to man.)

The end reaction of bovine and human strains have a sharply defined range in the hydrogen in concentration scale and the addition of an indicator such as methyl-red serves to distinguish the acid bovine strains from the less acid human strains. This disposes of one false lead supposing that recent epidemics of streptococcus infection came from milk, butter and cheese. Bovine types are of no clinical significance and milk is only dangerous when contaminated by human strains.

Measures for the control of streptococcus infection through the carrier point must depend on the result of bacteriologic studies.

George C. Dittman.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

Nervous and Mental Diseases. Church and Peterson. 9th edition. W. B. Saunders Co. $7.00.

Pathogenic Bacteria and Protozoa. McFarland. W. B. Saunders Co. $4.75.

Manual of Obstetrics. Hirst. W. B. Saunders Co. $3.00.

Manual of Obstetrics. Davis. W. B. Saunders Co. 2nd edition. $3.00.

Medical Clinics of North America. vol. 3, non. 2. Sept. 1919. W. B. Saunders Co.

Surgical Clines of Chicago. Vol. 3, No. 6. Dec., 1919. W. B. Saunders Co.

Miscellaneous Nostrums. American Medical Association. 4th edition. 1919.

Bacteriology in Abstract. Wallgren. Medical Abstract Pub. Co.

Systemic Development of Xray Plates and Films. C. V. Mosby Co.

Practitioners Manual of Venereal Diseases. Magian. C. V. Mosby Co. $3.00.

Modern Surgery. DaCosta. W. B. Saunders Co. $8.00.

Syphilis. Hazen. C. V. Mosby Co. $6.00.

MANUAL OF OBSTETRICS. By J. C. Hirst, Associate in Obstetrics, University of Pennsylvania, W. B. Saunders & Co., 1919, $3.00.

MANUAL OF OBSTETRICS. By E. P. Davis, Professor of Obstetrics, Jefferson Medical College, W. B. Saunders & Co., 1919, $3.00.

The author of the first volume intends it as a companion book to his Manual of Gynaecology.

The second volume is the second edition of the work.

These two volumes, of similar size and binding, dealing with the same subject, written by two recognized American authorities, and published by the same publishing house, may be properly discussed jointly.

They are of 485 and 466 pages of reading matter and 216 and 163 illustrations respectively.

The subject of obstetrics from a practical and working standpoint is thoroughly and completely covered. The reader can find readily any subject he might wish, and in a few sentences or paragraphs get the desired information without having to devote any time to unprofitable discussion.

Completeness, brevity, and conciseness are characteristic of both books and Davis, in the second edition, has added much new material on the subjects of differential diagnosis of early pregnancy, treatment of eclampsia by sedatives, hydatidiform mole, caesarean section and other leading and important phases of the subject.

For a ready reference book for both student and busy practitioner both volumes can be highly recommended. Albert G. Schulze, M.D.

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ORIGINAL ARTICLES

RATIONAL TREATMENT OF CARCINOMA OF THE UTERUS*

J. WARREN LITTLE, M. D.,
Minneapolis, Minn.

In the United States, 80,000 persons die each year from cancer. The recorded cancer death rate appears to be increasing in nearly every country in the world. The rate per 100,000 has risen from 62.9 in 1900 to 78.9 in 1913. In Minnesota, the rate per 100,000 has risen from 37 in 1900 to 82 in 1917, 83 per cent of the deaths occurring at the age of 45 and over. The average age age is 59 years. Among women, one death in eight, and among men, one in every fourteen is due to cancer. Statistics may be cited to show that the uterus is first in the list of organs effected by primary cancer.

Janeway states that from latest and best statistics from 8000 to 9000 women die from carcinoma of the uterus, in the United States, each year.

Welsh collected from literature, 31,000 cases of cancer, of which 29.5 per cent were of the uterus, 21.4 per cent of the stomach.

Orth says that carcinoma of the uterus forms 30 per cent of the cancers occurring in women. The United States Census of 1911, however, shows a marked predominance of cancer of the stomach and liver, over cancer of the female genital organs, owing chiefly to the better classification of sarcoma, myoma and cancer of vagina and ovaries from cancer of the uterus. The cases of the latter disease have tended to decrease in statistical observations, but it may still be said that carcinoma of the uterus is perhaps the most frequent seat of the disease in women.

*Read before the Minnesota State Medical Meeting, Oct. 1-3, 1919, Minneapolis, Minn.

In view of the appalling prevalence of carcinoma of the uterus, it is of the utmost importance that an early diagnosis be made. To do this, we must try to educate the physician as well as the patient and insist upon a thorough visual as well as bimanuel examination being made, whenever any symptoms indicating malignancy occur.

In spite of propaganda carried on to this effect, it is estimated that in this country only about 10 per cent of the cases presenting themselves for treatment are suitable for radical operation. In the absence of positive knowledge as to the cause of carcinoma, we must assume that it is purely a local process in its early stages. This assumption has warranted the surgeon in attempting its cure by radical operation. As a consequence of the anatomical relations and the difficulties of dessecting out the uterine lympahtic distributions, the results from the application of radical, surgical removal of carcinoma of the uterus, has not been satisfactory. The radical Wertheim operation has not met with general favor by the American profession owing to its high primary mortality and to the distressing sequelae.

Jacobson reports on 556 operations done by ten surgeons following the Wertheim technique, a primary mortality of 131, or 23.11 per cent; and the permanent cures after five years, 144 or 25.44 per cent. The average operability is 35.1 per cent. Wertheim's own figures for his operations are 714 operations with a primary mortality of 119 or 16.6 per cent, and the permanent cures after five years of 186, or 42½ per cent. His operability is 50 per cent and absolute cures, based upon the number of patients observed, is 20 per cent. Ten per cent of Wertheim's operations have ureteral vesicle and rectal fistulas and other complications. Are we justified in doing an operation with such high mortality and such dangerous sequelae for such a small number of cures?

There are other peculiarities about malignancy of the uterus that should be taken into consideration in the surgical treatment. Carcinoma of the fundus of the uterus tends to remain localized and does not metastasize easily until after it has reached the sub-serous covering of the body, and early removal of the uterus has given as high as 75 per cent of cures. On the other hand, carcinoma of the cervix, which Wertheim estimates twenty times more frequent in its occurrence than carcinoma of the body, invades the parametrium and lymphatics early and makes cure by radical surgical removal, very difficult.

Malignancy attacking the vaginal portion of the cervix may be considered under two clinical types. The fungating or papillary type, and the infiltrating or ulcerating type. This distinction is made not so much on histological ground as for the convenience in emphasizing the difference in treatment and prognosis. In treating the former, the fungating or papillary type where fungoid growths occupy the vaginal cervix and project into the vagina, are infected and produce more or less toxemia by absorption from its own ulcerating and infected mass, or produce pyometra by extension and interference with drainage, we have preceded the application of radium by thorough destruction of the mass with a cautery iron, being careful not to damage the bladder or rectum. This procedure facilitates the application of the radium to the outlying portions of the growth and the relief from toxemic absorption results in marked improvement in the patient's general condition. This type of case responds very well to radium and is slow to invade the lymphatics or other organs.

The infiltrating or ulcerating type early destroys the cervix with crater formation, extends on to the vaginal wall and invades the bladder and rectal septum. It is more rapid in extending into the parametrium and fixing itself to the pelvic wall. Intermittant hemorrhage and pain are more pronounced than in the preceding type.

Radium checks the local process readily in the early stages of this type but mestastases in gland or parametrium may be only temporarily inhibited, and destruction of life by interference with or invasion of the intestinal or urinary tract is liable to occur.

Malignancy arising in the cervical canal early invades the substance of the cervix and may extend directly into the parametrium or metastasize into the distant lymphatic glands without extensive involvement of the immediate surrounding tissue. In other words, the size or age of the growth bears no relation to the extent of the metastases. It is in this type of cancer that surgery has had to recognize its limitations and the question as to whether to operate or ray them, is now receiving serious consideration.

The gratifying results obtained from the use of radium as a palliative remedy in the hopelessly inoperable cases, have lead to its application in the border-line and operable cases with results that compare very favorably with those that have been obtained by the more radical surgical methods with their the high primary mortality and distressing sequelae.

The strong argument for the radical abdominal operation has always been the fact that it is the only method by which lymphatic metastases may successfully be removed, and yet few of the cases with such metastases have ever been cured by operation. The facts are now generally accepted that radium exerts a destructive and inhabitive effect upon the malignant cells, and that it is an effective agent for the destruction of malignancy.

Janeway concludes in his paper in "Surgery, Gynecology and Obstetrics" that the present evidence indicates that radium destroys the disease at this site to a greater distance than the knife is capable of removing it, and does this with no risk or inconvenience to the patient and only a small tax on the skill of the surgeon. Every effort should therefore be made to secure its general use throughout the country. He also states that this evidence may be premature in so far as operable cancer of the uterus is concerned. It is, however, conclusive for cancer of doubtful operability, and so strong for operable cancer of the cervix, that in the light of the other published observations the treatment of early cancer of the cervix by radium is, at the present time, justified.

At the present time there have been a great many reports from various radium clinics,

showing apparent cures of from two to four years standing in cases too extensive for operation, and it has produeed cures of three years standing and over, in a larger percentage of early eases than operation has produeed.

There ean be no question but that in the treatment of the large number of inoperable cases of eareinoma of the uterus radium has produced most gratifying results. Many of these eases that present themselves at a time when the disease is well advaneed, with large fungating masses and most foul smelling discharge aceompanied by more or less toxemia and infection, pain and hemorrhage, are transformed as if by magic in the course of a few weeks. The evidence of the disease disappears, all the symptoms are relived, the patient gains in weight and strength, her blood pieture improves, and to all appearances she is eured. Masses that have oecupied one or both broad ligiments with apparent fixation to the pelvie wall will sometimes be absorbed and more or less movement of the uterus be restored, changing what has appeared to be an inoperable case into an apparently operable one. It is our opinion however, at this time, that operative interference should not be attempted in such a ease until after at least a year of quiescence has elapsed, if at all.

CONCLUSION

In careinoma of the body of the uterus, a panhystereetomy should be done followed by prophylactic radiation.

In cervical eareinoma in the operable stage, either panhysterectomy followed by radiation or a thorough radiation without operation should be performed. From our present experienee and observation, we are inclined to the belief that as good or better results ean be obtained from radiation alone, with praetically no danger or pain to the patient, radium penetrating beyond where the knife ean be used.

In inoperable cases, radium is mueh superior to any other treatment. Where there are large fungating masses producing toxemia, they should be removed with cautery followed by radium.

We have abandoned the Percy cautery for radium. We do not advocate the Wertheim operation because of its high primary mortality, its serious sequalae such as vesicle, ureteral and reetal fistulae and because there are too few cures to compensate the difficulties and dangers eneountered.

DISCUSSION

DR. J. C. LITZENBURG, Minneapolis: Radium seems to be going through much the same course that every other treatment for cancer of the uterus has gone through. Any new or comparatively new method of therapy must go through four different stages. In the first place, when it is introduced it is belived in, by its introducers, and that period I call the period of neglect. Then by the results of their assiduous work the attention of the profession is directed to its use, and then it is used more or less promiscuously, judiciously and injudiciously. That is the period of exploitation. Then comes the reaction against the injudicious use, with the improper selection of cases, and we have a period of reaction against the use of whatever therapy it is. Those who have been using it promiscuously and without good judgment, become frightened by the bad results because of not using good judgment. Then we come to the period of rehabiliation. Everything that has been used in the treatment of cancer has gone through such periods. I take it that radium is now going through the period of exploitation, and that we must be very careful in analyzing the results that are reported from time to time, in analyzing the man that reports them and exercising judgment in coming to a conclusion. All these stages are necessary for the proper establishment of any good thing in our profession.

The Wertheim operation went through it all, has been in the stage of very bad reaction and has been very lately rehabilitated. I think, however, in so far as the treatment of inoperable cancer is concerned that radium or radiation has been pretty well established. It should not be forgotten in connection with radiation that radium is not the only radiating agent, and that the X-ray, properly applied by an expert, also gives good results.

I had a very interesting experience in Berlin, just as I escaped the war, in the University Clinic there, where the X-ray man had charge of all the cases of cancer that came into that big clinic. They had stopped operating entirely and were using deep X-ray therapy and had been reporting results quite equal to the reports of Dr. Little today. The thing that impressed me most about the use of radium in cancer is that its good results certainly justify further judicious experiments with it.

One particular danger which should be considered is the toxemia following its use. The period of reaction against any therapy comes chiefly from its promiscuous use and from men who do not recognize the dangers of employing any particular agent. It seems to me, that we have not yet arrived at the point where we can say positively that radium has taken the place of operation, but we have arrived at the point where we can say it is certainly a valu-

able therapy in itself, but probably is more of an adjuvant and a help in preparing the cases for operation and in subsequent treatment in destroying tissue which may have been left by the knife. Every paper I hear on cancer of the uterus impresses upon me the one fact that we are all desirous of combating this terrible scourge, and the figures of Dr. Little seem to indicate that it is rapidly on the increase. Our only hope is in propaganda and the education of the people so that these women will come to the physician for examination, not when their cases are inoperable but when cancer is suspected. I am reminded of the time when every laceration of the cervix was repaired for all sorts of symptoms, particularly nervous symptoms. Of course there has been a reaction against the exploitation of that operation, but I have wondered whether we have not gone too far in that; that perhaps not enough cervices have been treated after laceration and that reaction against the repair of lacerated cervices was due to the fact that it was injudiciously done and not in accordance with indications. I fear we have gone too far in that respect, because so far as the etiology of cancer is concerned we have learned only one fact, and that is the presence of chronic irritation. Perhaps we may have to do more prophylactic work with these patients and if we educate them to come earlier we must know about the early symptoms of cancer of the uterus.

DR. ROBERT EARL, St. Paul: We have had some little experience with the treatment of cancer of the uterus with radium. I believe I can heartily concur in all that Dr. Little has said. I am glad indeed to have heard him bring out the point that we can destroy considerable of this lethal tissue by the actual cautery, and afterwards treat the case by radium and in that manner get away from the absorption of toxins.

I believe it was Janeway who brought out the method of making a plaster mold of the cervix and placing radium in the mold and applying it to the cervix, thereby getting application from outside of the cervix. You can then establish protection of the bladder and rectum and, at the same time, introduce radium into the cervix. With that method of treatment he was able to accomplish more than by placing the radium in the cervix.

In treating cases of uterine carcinoma with radium and subsequently operating, we are probably going to get into considerable difficulty in the operation because the tissues will be so hard that they are difficult to cut and to manipulate. We have been in the habit, in our limited experience, of applying the radium to the uterus from the inside and then treating with the deep X-ray therapy from the surface. In that way we have been hitting it from both directions and with two remedies each one of which is very potent.

When I have a case of menorrhagia in which I am in doubt as to whether or not there is malignancy in the fundus, or if the menorrhagia is due to a non-malignant condition, a fibroid for instance, I am always greatly at a loss to know whether I should do hysterectomy or if I should treat the case with radium. These cases we have to differentiate in the best way we can, and in all of them we should certainly curette and examine the specimen removed by the curette. If it is found malignant we can go ahead and do a hysterectomy; if not, treat the case with radium, and in these cases of menorrhagia the results from the treatment of radium have been most gratifying.

DR. F. A. DUNSMOOR, Minneapolis: This paper of Dr. Little's on radium has brought to my mind the thought that when the subject of cancer is up for discussion, what an important study the cure of cancer is, and the one thing which impresses me is the fact that the people as well as physicians and surgeons should be educated so that the early discovery of cancer is brought to the attention of the physician who is to treat the trouble. If we are going to talk about the cure of cancer, we must talk about actual cures of the disease, so that when the disease is removed it will not return. To do this it is very essential to impress upon the physicians and the people at large the importance of getting these cases at the earliest possible moment. It does not make any difference whether you use paste, chlorid of zinc, the hot iron, or what not, but let us get down to brass tacks and admit that if there is any one stage in which cancer can be cured, it can be cured by the knife and stay cured. Unquestionably we can do a lot for those people who are so unfortunate as to be suffering from cancer. There are a lot of others who are not going to be cured, but does that mean they are not going to get any relief? Not at all. We do not have to say they are going to be cured. As the doctor has said, most of the inoperable cases are not going to be cured. They may be relieved temporarily. If radium will do what Dr. Little says it will do, then it should be used. We should not condemn a thing because it will not cure cancer in any stage, but when a remedy as potent as the hot iron or the chlorid of zinc is used, and used more extensively, we have got to adopt it. Radium will doubtless do everything that those remedies can do, and does do it with a certain amount of judgment applied to it. I do not imagine that if Dr. Little should find a case of beginning cancer in the fundus, if he did not have radium in his own possession, he would say it was necessary to apply it in that case, because if he has got a beginning cancer, he can cure it so that it will stay cured; it does not make any difference whether he uses the Percy hot iron or other methods of treatment.

We shall look forward to enormous benefits from radium as well as from other remedies and methods which the doctor has suggested. He did not narrow the subject down to the treatment of cancer by radium alone.

DR. LITTLE (closing the discussion): This is

pioneer work. We did not propose to tell you today that we know all about how much good radium will do. We are feeling our way along. We are working at it conscientiously, trying to do the best we can with it. We know it can do some things we could not do be before. We are not placing radium above early operation for cancer. Operation should certainly be done in carcinoma of the body of the uterus, and a panhysterectomy should be done in preference to the use of radium, because there is no metastasis in the early stage of carcinoma of the body of the tuterus, and you have a chance and a good opportunity to cure the patient without the application of radium.

Many cases have been cured by operation, but for fear there might be stray cancer cells left we advocate the application of radium with the hope that it may make doubly secure the operation.

Operation on the cervix is a very different thing. How many of you have seen cases of cancer of the cervix cured by operation? Very few. There will be an occasional case in which a cure is brought about, but in my experience I have seen very few carcinomas of the cervix cured by operative procedures.

The X-ray is quite similar in its effects to radium, and for that reason I advocate radium in preference to the X-ray because you can apply it to the part much more accurately than you can the X-ray. We often use the X-ray in conjunction with radium, and I am pleased that we have in our community Dr. Bissell, who is an expert in the giving of deep X-ray therapy, because I have seen his work and know it is productive of great good. I am not saying that radium is superior to the X-ray except that I believe it can be applied more accurately, and you can gauge the dose of it much more accurately than you can the X-ray.

We have not arrived yet at the proper treatment of carcinoma. We are treating what appears to be now a local disease, not knowing exactly what the cause of carcinoma is. We do not know whether we are treating it the right way when we are treating it locally or not. We have not arrived at that stage of perfect treatment of carcinoma. We are not claiming that.

Dr. Earl spoke of applying radium outside of the cervix. We put the radium in a tube and place it right inside the uterus. In case the uterus has been removed we wrap it in several thicknesses of gauze and over that place rubber and put it up to the vault of the vagina. We do that whether there is any recurrence or not.

A case was referred to me a few years ago in which there was a recurrence of the disease in the vault of the vagina following a vaginal hysterectomy. We gave this radium treatment and the patient is now free from any signs of recurrence. The disease had reappeared in the vault of the vagina. That is better than we could have done before by any other method so far as I know. You could not do it with the cautery, and there is no method equal to radium for that purpose.

Dr. Earl made a statement with reference to operation following the use of radium and saying that the tissue would be hard. The tissue of a radium scar is soft, not hard, and in the cases in which we have had a chance to dissect out the scar we have not found that hard condition of which he spoke. Take a burn on the face or any place, where you have a hard scar, if you apply radium the scar will soften up instead of being hard like a keloid. If you apply it to a keloid it will certainly make the keloid soft and pliable and will not leave a hard scar. It is not the kind of scar you get from the use of the cautery.

In examining the uterus if we are in doubt whether or not there is a malignant condition, we make a curettement and examine the scrapings and find out whether or not the disease is malignant, and if it is malignant, we would make the operation the same day or hour the curettement was made.

With reference to the remarks made by Dr. Dunsmoor, I always like to hear from him. He is a practical man and has seen and done a wonderful lot of work. The patient is entitled to some consideration if she has cancer.

We are getting to be a sort of clearing house for cancer. We do not know what to do with some of them. We get a lot of cases that we cannot do anything for. It is only human to do what we can for them, and if we can stop a hemorrhage, if we can stop a fetid discharge and render them comfortable for a few months or two or three years, we have done a great deal for them. I thank you for your attention.

RESULTS OF CHOLECYSTECTOMY*

By Warren A. Dennis, M. D.
St. Paul, Minn.

The report here presented covers those cases operated on during a period of three years, from Jan. 1st, 1915 to Jan. 1st, 1918. Out of a total of sixty-four cases, definite information was received from forty-nine.

The last case included is nearly two years old so that sufficient time has elapsed to permit of a reasonably fair judgment as to the results.

At the beginning of the period cholecystectomy was not employed as a routine measure although the belief was becoming crystallized that in any case of gall-bladder disease sufficiently pronounced to require operation at all, the operation of choice was cholecystectomy, and this gradually became the rule barring a small num-

*Read before the Minnesota State Medical Meeting, Oct, 1-3, 1919, at Minneapolis.

ber of exceptional cases. The purpose of the study was to determine, so far as was possible in so small a series of cases, whether or not the subsequent histories would show the rule to be a wise one to follow.

In considering the success or failure of a given operation account must be taken not only of the completeness of the relief of the condition for which is was undertaken, but also of its freedom from unpleasant sequelae. Operations in certain locations are particularly prone to these, and the gall-bladder region is in this class.

A good deal has been written as to the anatomic changes following cholecystectmy but almost nothing has appeared in the literature as to how the patient himself, or rather herself, has felt about the net results of the procedure. This report, therefore, will contain no reference to medical literature, but will be made up solely from the reports of patients operated upon in the private work of the writer.

The cases fall into two groups, those in which stones were present, and those without stones. From the first group, naturally, no conclusions can be drawn as to the relief of symptoms, since it is not possible to tell which should be ascribed to the stones and which to the chronic cholecystitis. The belief was expressed several years ago that colic, jaundice and acute inflammation should be regarded as signs rather of the complications of gall-stone disease than of the disease itself. If this view is correct, then it is probably fair to say that in the uncomplicated cases at least, the removal of the gall-bladder is the important factor. In all cases with stones a vicious circle is established in which chronic inflammation and stones react upon each other.

So far as untoward after effects of cholecystectomy are concerned, the cases having had stones have of course the same weight as those without.

The diagnosis, whether with or without stones, was made in every case but one on the presence of the well-known type of food idiosynerasy, and of gas belching and distress after meals if these foods had been eaten. In the single exception noted the first symptom admitted was a colic, and as this occurred for the first time only six weeks before operation, and all of the large number of stones found in the gall-bladder were extremely small, it was thought that both the stones and the cholecystitis were of such recent date that the typical symptom picture had not had time to develop.

Many cases, of course, presented additional signs and symptoms, such as colic, jaundice and acute inflammation in the gall-bladder and ducts, but as was just stated, these conditions are the signs of the complications which have resulted because of failure of recognition and appropriate treatment.

In the questionnaire sent out the information requested was: first, whether the patient had been relieved of the gas belching and distress; second, if not fully to what extent; third, whether there had been since the operation any tendency to disturbance of the bowels; fourth, whether there had been a gain or a loss in weight and how much, and, lastly as to the general condition now as compared with that before the operation.

Perhaps the chief cause for the collection of these data was the fact that several patients had complained of a tendency more or less pronounced to looseness of the bowels following the operation of cholecystectomy, and it was desired to ascertain whether or not others who had not mentioned it, had noted the same tendency. If at all general or pronounced it would have to be reckoned with in considering the question of operability in cases of chronic cholecystitis.

Of the cases without stones there were twenty-six from whom definite information was received. Of these twenty-three were women and three were men. The ages ran from 57 to 18, the average being 38 years.

Gas and distress after eating were relieved from three-fourths to completely in twenty of the cases, or 77 per cent; in three, or 11.5 per cent, they were about half as bad as before, while three patients, or 11.5 per cent, reported no improvement in this respect.

The three cases complaining of more or less diarrhoea, and from whom the suspicion arose that detailed reports might show that others had the same trouble, proved to be the only ones with it. Of these three one who was constipated before operation frequently has diarrhoea now. One who was normal before has an occasional diarrhoea now, while one who had it before is considerably worse now—3.8 per cent in each case. Three cases (11.5 per cent) who were

troubled by diarrhoea before, are normal now so that in only three cases, or 11.5 per cent, could cholecystectomy be suspected of being a factor in the causation of this symptom, while in three others there are as good reasons for ascribing to it the relief of the same symptom. The remainder, 77 per cent, having had no trouble either before or after operation, it seems fair to conclude that the gall bladder, present or absent, has little or nothing to do with the causation of this symptom.

Gain or loss in weight, in the absence of special reasons, is a pretty good gauge of general health. Of the twenty-six cases, eighteen, 70 per cent, had gained in weight from five to thirty pounds, an average of thirteen pounds. In five, 19 per cent, the weight had not changed, while in two, 7.7 per cent, there had been a loss, in one instance of twenty-five pounds. This was a woman fifty-seven years old, who herself ascribed the loss to her age. The other was a woman seventy-four years old, and her loss had been only recent, and following an apoplexy.

As to general condition twenty-two of the twenty-six, 84.5 per cent, declared themselves either perfectly well or very much better, while four, 15.5 per cent, reported themselves the same. None were worse than before operation.

It is interesting to note that the patient with the troublesome diarrhoea, a man, feels fine, except for that, and has gained twenty-two pounds in weight, and that one, a woman, who feels the same has gained five pounds in weight.

The cases having had stones at the time the cholecystectomy was done number twenty-one, of whom fifteen were women and six were men. The ages ran from 57 to 31, the average being 49 years. As to relief from gas and distress after eating, fifteen, 71.4 per cent, report it to be three-fourths or better. Two, 9.5 per cent, report it fair, and four, 19 per cent, poor.

In this group, four, 19 per cent, report some diarrhoeal trouble before operation. Two of these are entirely relieved, one is better, and one is the same. None report a change for the worse.

Fifteen, 71.4 per cent, have gained in weight from five to thirty pounds, or an average gain of fifteen pounds. Three, 14.3 per cent, weigh the same, and three, 14.3 per cent, have lost, one six pounds, one fifteen pounds, and one reports a loss of thirty-five pounds. Of these three one is 75 years old, one is 61, and one is 50. Of interest is the fact that of the four cases reporting failure of relief from gas and distress, one had neither gained or lost weight, two had gained ten pounds each, and one had gained twenty pounds. Possibly the temperament, optimistic, or the reverse, may be rather an important factor in determining the returns made in some cases. In several this seems reasonably certain.

As to general condition 16, 76 per cent, report it good, three, 14.3 per cent, report a fair improvement, and two, 9.5 per cent, say they are no better than before the operation, although each of the two has gained ten pounds in weight.

The group without stones shows a higher percentage of relief from dyspeptic symptoms than the one with stones and this is doubtless accounted for by the fact that many of the latter were complicated cases, almost half of them being acute empyemas.

The title of the paper might perhaps better have been the "Effects of Cholecystectomy" than the "Results of Cholecystectomy" since the aim was chiefly to determine whether the operation relieved the symptoms for which it was done, and whether it left as a result any unsatisfactory after effects which could properly be ascribed to it. In order however that the record of facts may be complete it is proper to state that in two of the sixty-four cases death occurred following operation. One resulted from pneumonia on the nineteenth day after operation in a case which had been septic for some time before and which had stones in the common duct, jaundice and a typical septic cholangitis. The other case was one of ruptured gall-bladder with stones and pus scattered thru the peritoneal cavity. In neither of these cases could death be ascribed to the cholecystectomy, and they are therefore not included in the statistical report, but should not be omitted from the record.

In two cases hernia followed the operation, both being cases of acute empyema of the gall-bladder. There was no mortality among the cases of uncomplicated, cholecystectomy, nor did hernia result in any of them.

There is one condition, however, following the simple operation as well as those with stones and complications, which undoubtedly is a large factor in accounting for incomplete relief from

symptoms, and this is post-operative adhesions. If the pyloric end of the stomach becomes fixed in scar tissue gas distress after heavy meals is likely to result. This is the cause of complaint with four of the cases with stones, and of two without stones. The best preventive measure is the fixation of a layer of omentum between the cigarette drains and the stomach, and this is a matter of prime importance.

Gas distress of this character is due to mechanical interference with the stomach and duodenum. The characteristic pre-operative gas belching seems to be due to a different, and unexplained cause, which is perhaps toxic, perhaps due to secondary secretory changes. Some cases still retain this for a fraction of the foods which regularly caused it before operation.

In two cases with unsatisfactory results the symptoms are such as to arouse suspicion of a stone having been left in the common duct, or of its having formed after operation. If so, these cases have nothing to do with cholecystectomy per se, but they do open the questions of the advisability of removal of the gall-bladder in all cases, and whether exploration of the common duct is indicated in a case of acute empyema. Both questions should be decided in the affirmative unless in some most exceptional case. The stone, which in cases of acute empyema, as was pointed out in a previous paper, is always found impacted, and frequently pocketed, at the entrance to the cystic duct, is often easily overlooked and difficult to remove without much soiling of the field, when only drainage of the gall-bladder is done. The result is a much slower convalescence and greater liability to neighborhood infections. As to exploration of the common duct, it is believed that this should always be done, even in the presence of an acute empyema, when the symptoms cause a suspicion of stone in that location.

There is one other source of unsatisfactory results following cholecystectomy—incorrect or incomplete diagnosis. This error is most likely to be made, it is believed, in some cases of ptosis. The dyspeptic symptoms of ptosis are quite different from those of cholecystitis and the X-ray is definite for the former, but even if a ptotic case has also a chronic cholecystitis it should ordinarily be left alone, since cholecystectomy can not relieve more than a fraction of the pathology. The lesson which was learned in connection with appendectomy in this class of cases applies with even more force in the case of cholecystectomy.

In conclusion, it would seem fair to say that the subsequent histories of these cases justify the conclusion that cholecystectomy should be the rule when operation on the gall-bladder is required.

DISCUSSION

DR. E. STARR JUDD, Rochester: I enjoyed reading Dr. Dennis' paper very much and likewise enjoyed listening to it, especially in view of the fact that several years ago I undertook a study of the results in cholecystectomy. At that time I tried to find out after a number of years how patients had gotten along without their gall-bladders and to see if the gall-bladder was really essential. I found 15 patients I knew of, who had been without gall-bladders for fifteen years or more, and apparently they were just as happy as ordinary individuals with gall-bladders, which is just a little different from the report Dr. Dennis has made. I also carefully studied the cases and found that quite a percentage of these 15 complained of the same gas in their stomach that they had before cholecystectomy was done. Aside from that, however, the patients were entirely relieved.

About the same time we undertook other studies. Dr. Dennis does not cover the anatomical changes resulting from removal of the gall-bladder, but I think the more we study them, the more knowledge we will get of the changes and the symptoms that occur.

In our experimental work which Dr. Mann and I carried on some years ago of removing gall-bladders from animals, we first found dilatation of the common duct which apparently continues, only the dilatation involves that part of the common duct outside of the duodenum, and there is no dilatation of the intrahepatic ducts. After the dilatation reaches a certain point the little sphincter muscle at the end of the duct first described by Oddi, and more recently by Archibald, becomes paralyzed, so that while the normal bile pressure in the common duct is 150 to 200 millimeters of water, after the gall-bladder has been out thirty to forty days, the bile pressure is practically gone. There is paralysis of this little sphincter muscle as a result. That, it seems to me, will explain the diarrhea that occurred in some of our cases following cholecystectomy. These patients would have a normal bowel movement in the morning, and once or twice a day they would have a movement of almost pure bile.

There are one or two points I want to mention that are not at all settled, one of which is hepatitis in association with cholecystitis, and whether the persistence of hepatitis could be the cause of some of these symptoms. Evarts Graham in a study of

cases at the time he removed the gall-bladder and removed pus from the liver for microscopic study, reached the conclusion that practically every case of cholecystitis had associated with it hepatitis, so this may explain some of the cases that do not get complete relief from the symptoms.

Another feature is the pancreatitis that is so often associated with these cholecystitis cases. I think that where pancreatitis exists, we used to consider it a contraindication to removal of the gall-bladder, but if our experiments are of any consequence, the removal of the gall-bladder is indicated especially when there is pancreatitis existing. If pancreatitis exists it is due to the fact that the bile enters the pancreas by back pressure from the Oddi sphincter, forcing it up into the pancreatic ducts and into the pancreas. Pancreatitis can be produced every time by injecting bile into the pancreatic duct. If we accept this as the etiology of pancreatitis as we see it in association with cholecystitis, and we have such men as Opie who first suggested it and Archibald who believes it is the cause of pancreatitis; if removal of the gall-bladder results in paralysis of the sphincter and does away with the bile pressure in the common duct, then we have a definite indication for the removal of the gall-bladder rather than drainage.

DR. EARLE R. HARE, Minneapolis: Dr. Dennis has reached the conclusion in his paper that wherever an operation is advisable on the gall-bladder the removal of the gall-bladder should follow; otherwise I would have no opportunity to inject into this discussion the old question we hear threshed out at every session whether or not the gall-bladder should be removed in all cases. With the small experience I have had, personally I am still conservative with reference to the removal of the gall-bladder in all cases. In that sense I am somewhat a professional heretic even yet. If we have a stone impacted in the distal end of the gall-bladder, we have then dilatation of the gall-bladder. If that be true, the removal of the gall-bladder obliterates the gall-bladder, and if we have obliteration of the gall-bladder by impaction of a stone in the distal end of the duct, we should have, as Dr. Judd has pointed out, paralysis of the sphincter muscle following the dilatation of the common duct. I do not believe that those of you who have seen the common duct following a long period of complete occlusion of the cystic duct will agree that there is a dilatation of the common duct. Now, there must be something different, that is, between the removal of the gall-bladder and the occlusion of the gall-bladder or its pathological removal, if you please, in the effect upon the common duct. If that be the case, then I still adhere to my former position that the removal of the stone which is impacted in the distal end of the duct, provided there is not sufficient pathology in the wall of the gall-bladder to have completely obliterated its function, and the drainage of the gall-bladder ought to be followed by a certain percentage of restoration of function in the gall-bladder. If this be true we shall, unless it be in cases of pancreatitis, have done our patients just as much good as thru the removal of the gall-bladder. I do remove the gall-bladder in some cases, but I do not know when it is best to remove the gall-bladder and when it is best to leave the gall-bladder alone in all cases, and I do not believe there is anybody who knows that.

I have listened to discussions from one end of this country to the other on this subject, and that seems to be the concensus of opinion of those men who discuss it. In a certain percentage of cases, at least, the gall-bladder should be drained; that it should be given an opportunity to restore its function in part or in toto, and the patient resume his normal health. Now, I will say this, if we can by the removal of the gall-bladder remove all of the pathology, then I think it is the thing to do, but the fact that we have a hepatitis, that we have an inflammation of the ducts in the liver, that sometimes we have stones up in the hepatic ducts that we cannot remove, bile sand if you please, then if we remove the gall-bladder we are removing but a part of the pathology, and I believe we are leaving the patient in a crippled condition by the complete removal of the gall-bladder and by the consequent dilatation of the common duct and by the paralysis of the sphincter muscle which protects the bowel from the constant influx of bile.

DR. CHARLES H. MAYO, Rochester: I think all of us who have done much gall-bladder surgery have had some difficult cases to deal with and bad results. I think I have had my full share of every kind of thing that could possibly happen following gall-bladder surgery.

It seems to me, there are two or three principles involved in this discussion, one of which naturally raises the question of how the ducts work. Nature never delivers the duct directly to the surface of the body. It is always by indirection, always as a crooked outlet, and in the ducts, the mucous glands, and in the gall ducts, it runs for a distance between the muscularis and mucosa, and on account of internal tension the duct pinches up.

Keefe's work on resection of duodenums of cadavers and tying the ends with a view to finding out how infection may occur, whether it went up the duct or not, shows that he could rupture the duodenum every time before he could force anything whatever in the end of the duct. He found that the more distention he produced the tighter he pinched the duct between the wall and mucous membrane.

The question comes up with regard to the use of the gall-bladder. It is built like a duct. It consists of elastic connective tissue and muscularis and acts as a bulb which takes care in healthy people of an ounce of bile made by the liver each hour for a number of hours without letting us know anything about it. In the general surgery of the abdomen we find gall-bladders of all sizes according to the amount of bile in them. If we operate a second time

on a patient that has been drained, regardless of the fact whether the gall-bladder has been sutured to the abdominal wall or not, we will always find it adherent in a mass of adhesions.

With a normal common duct of one-sixth of an inch and a cystic duct of one-eighth of an inch in size, I have never seen a gall-bladder thrown out of commission by the surgeon or by disease, but when the common duct is larger than one-sixth of an inch, we have then a rim of muscle at the outlet of the common duct, and nature delivers from the pancreas through the same duct. Pancreatitis rarely exists of itself; it is secondary to gall-bladder trouble, and we have a basis for diagnosis in the presence of stones, in the glands that drain the gall-bladder, cystic, and the hepatic and common ducts.

It requires many examinations in all types of individuals with the abdomen open to tell the difference between a normal gland and a swollen gland. In human beings we have as many as three glands, one on the stomach, one on the common duct, and one on the cystic duct. In some human beings there are as many as six glands found.

We have secondary inflammation; we have interstitial pancreatitis very commonly, and it behooves surgeons in doing gall-bladder surgery to give a careful description of the condition of the pancreas present, because many of these people have acute colic and they describe their pains as being in the ducts. They have recurrent pancreatitis, and if you do not write that thing down at the time you will forget about it, and very often it helps you in your examination for things in the upper abdomen.

One-quarter of all people who have gall-bladder disease have no stones. We find it is the pelvis of the gall-bladder that is structurally increased; there is fatty degeneration of the mucous membrane here and not of the fundus. If we have a papillary growth of the gall-bladder, of which we have seen 180 cases, it is down in the pelvis.

In primary cancer of the gall-bladder the disease develops from chronic irritation due to stone. We have to think of that condition if we leave a diseased area and remove an impacted stone in order to get drainage.

What Dr. Judd said about gas symptoms is true, and in the after-treatment these patients complain of gas attacks as a part of their symptoms, and they should be looked after for a long time after operation to prevent gas distention. The stomach should not complain of what is put in it, but only of trouble caused during the process of digestion. Qualitative food dyspepsia is illustrated in leaving gall-stones. Qualitative food dyspepsia is associated with gall-bladder and pancreatic conditions, while quantitative food dyspepsia is associated with troubles in the lower abdomen and of troubles with peristaltic action.

DR. ARCHIBALD MACLAREN, St. Paul: Just a word or two in regard to my rather limited experience in surgery of the gall-bladder. Dr. Hare touched on a point which interested me, and that is, it is very difficult to tell when the gall-bladder should be removed and when it should not be. My feeling is that the acute gall-bladder should seldom be removed because of my own personal experience. Acute gall-bladders are in my hands extremely dangerous, and I much prefer to operate upon a patient more than once, than to do the radical operation which ends all.

From acute gall-bladders of the gangrenous type, I have had a number of deaths, but how many I cannot say in the last few years. I did not have these deaths when I drained my gall-bladders. Drainage of the gall-bladder is a very difficult question to decide. I am often in doubt as to when to drain and when to remove the gall-bladder. I am more and more on the conservative side and am willing to drain more of these gall-bladders than to remove them, especially those of the acute type, because of the exceedingly high mortality. I have just had a death in an acute gall-bladder case. I happened to be in Omaha at about that time and I asked Dr. Jonas, one of the big surgeons in every way in this country, what he did with his acute gall-bladder cases, and he replied, "I never took one out yet; perhaps I will after while."

DR. A. C. TINGDALE, Minneapolis: I wish to recite a case in which the gall-bladder was drained a year ago by another surgeon. The case came to me recently and I removed the gall-bladder with a stone as large as a horse chestnut.

I would like to know if it is possible for that sized stone to form within a year or so, or was such a stone overlooked. It was a good surgeon who drained the gall-bladder, and there is no reason to believe that he left such a stone, and I would like to know whether that has been the experience of any of the operators here.

DR. DENNIS (closing the discussion): If Dr. Judd understood me to say that relief followed in all of these cases he misunderstood me. There is a certain percentage of them that still have trouble with gas, but most of them have very little trouble, most of it having been relieved.

In regard to cholecystectomy in these cases of acute gall-bladder, I drained them formerly, and I think I can answer Dr. Tingdale's question by saying that I think the stone was left in the gall-bladder. I have done it myself and so have other surgeons. I have left a large stone in the gall-bladder because I could not feel it on account of the thickened condition of the gall-bladder. This experience led me to take out the gall-bladder. I drained many of these acute gall-bladder cases and then made up my mind to remove the gall-bladder. It is easier to take these gall-bladders out than it is to drain them, and if you have a stone at the entrance of the cystic duct you can take it out without rupture, and you do not have adhesions after operation such as you have if you drain the gall-bladder. Not only that, the symptoms within two days, if you are dealing with a simple acute empyema of the gall-bladder,

are practically all cleared up. The temperature, instead of being up for a week or two weeks, drops back to normal and convalescence is uninterrupted.

The conclusions which I have arrived at and presented in this paper are the results of my own experience, and I wish to apologize here to Dr. Judd for having neglected to mention his studies along the same line a number of years ago.

In answer to the remarks of Dr. MacLaren, I think it is very much better to take out the type of gall-bladder that he refers to. If there is any question about the advisability of taking the gall-bladder out, it is in the acute case of empyema of the gall-bladder. I will grant that occasionally there is a case in which it is not wise to do that, and that is when the acute gall-bladder has no meso-cholecyst and hence, if removed, must be dissected out of the liver. In the exceptional case of this character it may be wiser to drain than to remove.

PALLIATIVE TREATMENT VERSUS THE RADICAL TREATMENT OF TRIFACIAL NEURALGIA*

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The treatment of trifacial neuralgia has varied from many different palliative to the most drastic methods. With the exception of the deep alcohol injection, the palliative measures have been of very little value, and the radical treatment was, at first, attended with so many complications that it was tried only as a last resort.

The etiology of trifacial neuralgia is still unknown. Frazier asserts that it may be due to a sclerotic lesion of the ganglion; Dana ascribes the probable cause to degenerative changes in the ganglion; Patrick does not accept either of these as causative factors in the etiology, and Sir Victor Horsley believed that it is due to an ascending neuritis from dental infection. This, however, has been objected to by a number of physicians on the ground that no anesthesia nor motor paralysis is present in patients suffering from tic douloureux. Sluder has reported cases that he believed were due to sphenoidal infection; he attributed the recurrence of pain to recurring infection. In the various cases observed at the Mayo Clinic, however, it is not at all uncommon to see patients who have had numerous teeth removed, or repeated drainage of the antrum and accessory sinuses, or spurs removed from the septum who still complain of recurring attacks of trifacial neuralgia.

Trifacial neuralgia is distinguished from almost all other pain about the face and head by the severity and brevity of pain brought on by slight peripheral irritation, such as eating, talking, drinking, exposure to drafts, brushing the teeth, or washing the face. The pain is described by patients as shooting, jabbing, flash-like, darting, or burning, as if a red hot poker had been jabbed into the face. It differs from pain caused by sinus or dental infection as it is not constant and usually occurs during the waking hours. It is brought on by touching the trigger zones, as described by Patrick; "touching areas over the mandibular division may produce attacks of pain in the ophthalmic or in the supramaxillary divisions."

The disease usually occurs at about middle life; Patrick reports one case, however, in which the symptoms were manifest at the age of seven, and three in which the patients were seventy-five years of age. There are no predisposing factors, and, while some patients are neurotic, others are not. The disease is not hereditary; there are cases on record, however, in which several members of the same family were afflicted.

Formerly aconite, morphin, belladonna, and various courses of catharsis were used in the treatment. Local operations, such as removal of teeth, drainage of the antrum, and treatment of the nose and pharynx by local applications were later resorted to, and these methods are still employed by a number of surgeons. Avulsion of the peripheral divisions of the fifth nerve with insertion of plugs and screws into the inferior orbital and dental foramina was also employed. While avulsion of the peripheral divisions gives palliative relief for an average of eight months (Beckman) it is not satisfactory because repetition of the treatment is quite impossible, inasmuch as pain is apt to recur before the peripheral segments have regenerated sufficiently to permit re-avulsion.

Alcohol injection of the peripheral branches of the fifth nerve was first described by Pitres and Verger, in 1902, and by Schlosser in 1903. Hortel, in 1914, described the technic for in-

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jecting the gasserian ganglion with alcohol. The technic that is most often followed was described by Levy and Baudouin, in 1906, and slightly modified by Patrick in 1907. The alcohol is injected into the peripheral divisions at their exit from the foramina; this treatment is definitely indicated as in a certain group of cases it affords temporary relief; in others, relief is afforded for several years. I believe that every early case should be treated with one or two alcohol injections, and that the patient who is a poor operative risk, and the aged patient, should also be injected with alcohol instead of being submitted to the more radical treatment. It is true, of course, that each successive alcohol injection affords a shorter period of relief.

The first radical operation was performed by Rose in April, 1890, when he removed the gasserian ganglion for the relief of trifacial neuralgia, approaching the ganglion through the floor of the middle fossa. On account of the serious complications encountered in the way of bleeding and paralysis, he was compelled to abandon this procedure. Hutchinson, in 1898, advised a partial resection of the ganglion. He resected the outer two-thirds, including the second and third branches, thus saving the opthalmic division and preventing complications in the eye. This operation relieves patients who are suffering from neuralgia in the second and third branches, but it does not relieve those who have an involvement of the ophthalmic division; besides, it is attended with serious bleeding. Spiller, in 1898, suggested the division of the posterior root, a procedure known as the "physiologic extirpation." Spiller and Frazier, in 1900 and 1901, carried out a series of experiments demonstrating that regeneration does not take place in the posterior root after it is divided, and, in 1903, their work was corroborated by Van Gehuchten. In 1918, however, Frazier reported a series of cases in which successful results had been obtained by the division of the posterior root.

In a review of the cases treated at the Mayo Clinic, it was found that from January, 1910 until October, 1919, 318 patients suffering from trifacial neuralgia have been treated. One hundred eighty-six of these were males, and 132 were females. Our records show that the average age of these patients at the time of admission was fifty-five years, the average duration of trouble seven years, and the onset of the trouble, in the majority of cases, between thirty-five and fifty-five years. In 13 cases the onset of the trouble occurred after the age of seventy, 2 of the patients being seventy-seven years of age; in one case the trouble began at the age of fourteen.

Four patients had involvement of the ophthalmic division alone, 64 of the supramaxillary division alone, and 73 of the mandibular division alone. Twenty-two patients had involvement of the ophthalmic and supramaxillary divisions, 2 of the ophthalmic and mandibular division, 129 of the supramaxillary and mandibular division, and 24 of the ophthalmic, supramaxillary, and mandibular divisions, making a total of 52 (16 per cent) ophthalmic division involvements, 237 (74 per cent) supramaxillary division involvements, and 228 (70 per cent) mandibular division involvements.

Eight hundred five alcohol injections were administered in the series of 318 patients, which is an average of 2.5 injections for each patient. During the course of the treatment, either at the clinic or elsewhere, there were 17 drainages of the antrum, 71 extractions of teeth, 11 nasal operations, 11 maxillary operations, and 93 nerve avulsions, a total of 203 palliative operations in addition to the 805 alcohol injections.

Ninety-five of the 318 patients had radical operations, 9 ganglionectomies, 4 removal of gasserian ganglion tumors, 49 avulsions or resection of the posterior root, and the posterior root was cut in 33. Five were re-operated for trifacial neuralgia, probably not because of regeneration of the posterior root, but because a complete division of the root was not effected at the primary operation. Four patients died, 2 from hemorrhages, 1 from meningitis, and 1 from exhaustion and senility, as there was no evidence of meningitis or hemorrhage.

Operations on the gasserian ganglion have been attended with serious hemorrhages, paralyses of the third, fourth, and sixth cranial nerves with occasional involvement of the whole seventh nerve, ankylosis of the jaw, and trophic interstitial keratitis. However, improvement in the methods of surgical technic, with the introduction of specially devised instruments for ligation of the middle meningeal

and a ganglion retractor, equipped with a small light, as well as the use of small dental packs in dissecting the dura, has permitted a more careful dissection and made the control of hemorrhages less difficult. By holding the dura taut and not resting the ganglion retractor on the cavernous sinus, paralysis of the ocular muscles has been avoided. The frontal branch of the seventh nerve is left uninjured by making the skin incision 3 cm. posterior to the external angle of the orbit. By cutting the posterior root instead of avulsing it, thus preventing injury to the pons (Adson), and by not stripping the dura over the petrous bone, paralysis of the seventh nerve has also been lessened. Since the adoption of Frazier's incision, instead of the Hartley-Krause incision, in which the temporal muscle is split instead of incised, ankylosis of the jaw is rarely a complication. The occurrence of trophic interstitial keratitis has also been greatly lessened since the dura propria is not opened except over the posterior root where the fibers are cut, thus eliminating extensive exposure of the ganglion and avoiding injury to the ophthalmic portion of the ganglion, which either has a trophic supply to the cornea or sympathetic communications with the carotid plexus that protect the cornea against slight abrasions and ordinary irritations.

Operation

The patient is placed in a semi-erect position with the head on a special headrest which may be raised or lowered to the position desired. A general anesthetic is used. The anterior limb of the question mark incision over the temporal region and down in front of the ear to the zygoma begins 3 cm. posterior to the external angle of the orbit and 3 cm. above a line drawn parallel with the zygoma. The temporal muscle is split and the skull exposed by a mastoid retractor. A subtemporal decompression is done, and an area of bone about 3 cm. by 3 cm. is removed. The dura is gently elevated from the middle fossa until the meningeal artery, which we prefer to ligate, is exposed. The foramen is plugged with bone wax; this is followed by further elevation of the dura until the posterior margin of the third branch appears. Dissection is then carried posteriorly and inward, exposing only the posterior margin of the ganglion. The dura propria is not opened until the region of the posterior root is reached; thus injury of the ganglion is avoided, particularly of the inner portion, the cells of which control the ophthalmic branch. Before the dura propria is opened directly over the posterior root all bleeding is controlled. The dura covering the brain is held under gentle tension and the cavity is well illuminated by means of the ganglion retractor. After the dura has been opened, the fibers of the posterior root are gently exposed and slightly elevated, and the guillotine knife is slipped over the fibers which are to be cut; thus any trauma to the pons or brain stem is avoided. The cavernous sinus is rarely injured, inasmuch as all the anatomic marks may be seen clearly. The fibers of the posterior root just above the ganglion are turned down over the ganglion while the proximal fibers are pushed back into the posterior fossa. A small pledget of muscle is inserted into the dural foramen as a plug; this assists in making a barrier between the severed ends and prevents the extensive loss of cerebrospinal fluid that usually follows the patient's recovery from the anesthetic. If there is any danger of bleeding, it is well to insert a narrow strip of iodoform gauze, and remove it on the third day. The muscle and fascia are closed with interrupted sutures of chromic catgut No. 1. The edges of the skin are approximated with interrupted sutures of silk which are removed on the fifth day. During the operation the eyelid is covered with adhesive which is replaced by a Buller's shield before the patient leaves the operating room. The shield is worn for a week or ten days and subsequently is exchanged for close fitting automobile goggles, to be used whenever the patient is exposed to wind or dust. In addition to wearing goggles, irrigations twice daily with a 2 per cent boric acid solution are advised.

Summary

Eight hundred five alcohol injections have been administered in the series of 318 patients in addition to 203 other palliative operations, making a total of 1,008 palliative surgical treatments. Ninety patients have had the radical operation with complete relief, the remaining 228 are still seeking relief by temporary methods.

Having personally divided the posterior root in 74 cases of trifacial neuralgia, I am convinced that the radical operation is indicated in operable cases after one or two alcohol injections, in preference to continuing the palliative procedures indefinitely.

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DISCUSSION

DR. CHARLES R. BALL, St. Paul: In the beginning, I wish to say just a word or two with reference to trifacial neuralgia and focal infection. In a very intimate acquaintanceship with this subject extending over thirteen years. I have not seen one case which has been benefitted by treatment directed towards the removal of focal infection. Usually, these cases are like most other cases I get. Before they go to the neurologist they have gone the rounds, their teeth have been extracted, and the palliative procedures which Dr. Adson has spoken of have been done. In some cases the entire jaw bone has been removed, and finally in desperation they consult the neurologist.

In regard to the etiology, we have not been able to solve the mystery of the etiology of this disease, but there are cases of what might be termed irregular atypical cases which go a long way towards giving us an angle of what the source of the trouble is. The idea that it is not a disease due to extraneous irritations, that it is not exogenous in nature, that it is endogenous, that it is a disease per se, seems at the present time to be the consensus of medical opinion. In these bizarre cases we find a symptomatology different from what it is in the typical cases, especially with regard to the nature of the pain. We always hear a trifacial neuralgia spoken of as being a lightning pain, agonizing pain, jabbing pain, burning pain, with a free interval, and then another pain, the pain lasting for a second or two, and the interval so short that the pain seems almost continuous, but if one inquires carefully there is a free interval.

This spring I had an unusual case of what I thought was trifacial neuralgia in a young woman. She was thirty-two years of age at that time, and the neuralgia began ten years ago. It seemed to me intimately related to her period of menstruation, and after she had had about six or eight weeks of pain which came in definite attacks, the pain always

stopped with the ending of menstruation, and two or three days before she could usually tell when it was going to disappear. After she was having pain and became pregnant, the pain always stopped during pregnancy, and she remained free from pain during the entire period, and then after her delivery, she started again with her pain. When I saw her she was having pain once every hour with the precision of clockwork. This pain would come in attacks lasting fifteen minutes in duration by the watch, and then she would have a free interval, and so on. Before she began to have trifacial neuralgia she had had a typical migraine headache. Since the beginning of the neuralgia the headache had disappeared. I relate this case because of its atypical character and because, it seems to me, to help point the way toward the etiology of the disease, and I think we should not seek it in focal infections but should regard it as a disease per se.

With reference to the method of dealing with it, I condemn just as Dr. Adson does palliative operations, such as evulsion of the nerve at the infraorbital and supraorbital margins, because these operations are always disfiguring; they make further treatment more difficult, and are exceedingly temporary in character.

We have then, two lines of treatment to consider. The first is the alcoholic injections, and the second a radical operation. In considering a radical operation we have got to consider that some things have changed.

Several weeks ago I went on a fishing trip and took my automobile. I got up in the morning, took my automobile, and drove seventy miles to a trout stream, arriving there about eight o'clock. Twenty years ago I would have been crazy to have considered making a trip of seventy miles, getting up early in the morning and being at the trout stream at eight o'clock.

The neurological surgeon is seeing improved technic in his work. The radical operation now is an entirely different proposition from what it was five years ago, and in considering it you must take that fact into consideration. Dr. Adson has been one of the men who has helped to develop this operation, and I agree with him in every particular.

In deciding for your patient what procedure you are going to recommend, you must bring great stress to bear on the fact that the neurological surgeon has improved in his work, and you must look at the matter in very much the same way that you would have regarded abdominal operations seventy years ago for an appendectomy or for excision of the gallbladder. You would regard it now as a different thing altogether.

There are other factors that come in with reference to operation. I think first the alcoholic injections should be tried, and if they fail to give relief, or only give temporary relief, and have to be frequently repeated, other things being favorable a radical operation is the procedure to recommend.

In considering this operation one must remember the type of patient. I have found tic patients who have pain in the region of the ophthalmic branch are not favorable ones for successful alcoholic injections. Necessarily, in order to get this branch, you must go in through the eye and in going in through the eye it is a blind procedure, and every time I look at the position of the first branch of the nerve, where I expect to get it, and the optic nerve, I get the reverse because, it seems to me, that I would be just perhaps as apt to injure the optic nerve as I would the ophthalmic nerve. So if you get a severe trifacial neuralgia of the ophthalmic branch, a radical operation would be the most satisfactory. Then, you must take into consideration that this is still a major operation, and in selecting it for your patient you must consider whether the patient is in good general health and nutrition and has freedom from complications. Is the age of the patient such that you would feel like recommending any other radical operation? If you have a patient that will successfully withstand an excision of the gall-bladder, an appendectomy, or an operation for stone in the kidney, then you should have no hesitation in recommending this operation of evulsion of the fifth nerve in tic douloureaux. If a patient is in the region of seventy or eighty years of age, and I had one case ninety years of age, a radical operation is not to be thought of.

The point I want to make is that the neurological surgeons, and Dr. Adson in particular, have so developed this operation that it can be done in many instances today where it would not have been attempted many years ago. Dr. Adson has made this operation safe and successful because he has developed the ways to do it. He showed the little retractors he has devised and which he uses in connection with the operation. I would commend these retractors to you; they enable him to go in there and light up the interior of the cavity so that he knows every step he is taking in the operation, whereas before it was more or less blind and obscured by the oozing.

DR. L. C. BACON, St. Paul: It has been my pleasure to see some of the admirable work done by Dr. Adson, and without any question most of these cases, particularly those of long standing, must be reached by these means.

I want to protest a little against the trend of the discussion of this subject insofar that we are advised by Dr. Ball not to waste time in looking for focal infection. We are all influenced by our personal experiences somewhat, and from two cases that have come under my observation, I think by all means in early cases we should look for focal infection. One of these cases I have had within two years. A man from the country came to me with a history of an abscessed tooth about seven or eight months before it as extracted. In two or three months after this time he began to have symptoms of this very distressing disease. The X-ray led us to

locate a small encapsulated pus containing cavity in the ramus of the lower jaw. For two or three months following the removal of that there was no particular subsidence of the disease, but within a year it had entirely cleared up.

One other case somewhat similar occurred five years ago, which makes me feel that we should look for focal infection. All of the causes of the disease we will not attempt to enumerate, but I am convinced from past experience with cases that there are infections of some sort back of it.

DR. W. L. BENEDICT: Dr. Adson has spoken of complications arising from extirpation of the ganglion and among these he mentioned trophic keratitis. It has been my privilege to see nearly all of the persons on whom Dr. Adson has performed this operation; complications in the eyes have followed in five. Four of these occurred in persons who were operated on before 1918, and one following an operation this year.

The keratitis that follows extirpation of the ganglion in these cases is not typical of trophic keratitis and should not be so classed. All the patients who have been referred to the Section on Ophthalmology following this operation showed an abrasion of the epithelium, usually in the lower part of the cornea. The abrasion of the epithelium appears first; the injection of the conjunctiva and the infiltration of the cornea follow.

It is now customary to protect the eyes of the patient from injury during operation. The patients are also advised to wear a special type of goggle for several months after the operation. We believe this protection is important because after extirpation of the ganglion, corneal ulcers do not yield readily to treatment. By affording better protection to the eye from injury, we may eliminate keratitis as a danger or complication of this operation.

DR. EDWARD J. BROWN, Minneapolis: I understand Dr. Ball to say that he had seen no benefit from the removal of focal infection. I remember two cases in which I was able to give the patients very decided temporary relief by such treatment. One patient was an old man, eighty-two years of age, by the name of Fish whom Dr. Ball will perhaps remember as under treatment for some little time, and I was able to give him marked relief by washing out his left antrum. At the time he disappeared, and a good many months later returned saying Dr. Ball had permanently cured his trifacial neuralgia by the injection of alcohol. That was not, however, entirely permanent. Later he returned to me and I gave him more or less relief by cleaning out the antrum.

I have had another case in a man over sixty years of age, in the last few years, to whom I gave very marked relief by opening up and cleaning out the right antrum. The pain was chiefly in the side of the nose and lip. I also injected the infraorbital nerve. He was given marked relief, but it was not permanent. He came back again after about a year when the treatment was repeated. I have not seen him since then, and perhaps he has gone to Dr. Ball.

PROTEIN SENSITIZATION IN ASTHMA AND HAY FEVER*

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A study of protein sensitization as a cause of asthma was undertaken two years ago by Dr. Fricke-Davis, a Fellow on the Mayo Foundation. Her investigations are still in progress and the complete report and analysis of these cases will be reserved until some future time. The present clinical report, then, may be considered only as preliminary and as intended to serve merely as a guide to the study of cases of this type.

The subject of protein sensitization in asthma and hay fever has received consideration at the hands of many investigators during the past few years. However, our work has followed chiefly that done at the Peter Bent-Brigham Hospital, Boston, by Walker and his co-workers, June Adkinson and Wodehouse, who have made a thorough and exhaustive study of the causes of bronchial asthma.

About twenty-five papers have been published by this group of investigators. Nineteen have appeared as studies. Studies I, II, and XIX deal with the organisms found in sputum of asthmatics. Study III deals with the evidence of sensitization to the bacterial proteins, as demonstrated by skin reactions. Study XIII, by Walker and Adkinson, is on the relation between the cutaneous reactions, serum agglutination tests, and bacterial examinations of the sputum and nasal secretions in determining what part organisms have to do with bronchial asthma. Study XV is on the treatment of such patients with vaccines made from these organisms. Studies IV, VI, VII, and VIII cover the findings in patients sensitive to animal emanations, the serum, dander, and hair of the horse, and the hair of the cat and dog. Studies V and IX deal with the proteins found in various cereals and their relations to asthma. Study X takes up the sensitization of patients

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with bronchial asthma to the proteins of animal, fruit, and vegetable foods. Study XVI considers more specifically the proteins found in the different parts of plants and the individual proteins of cereals. Study XI deals with the important subject of the relation of pollens to bronchial asthma. Study XIV is on the treatment of patients by subcutaneous injections of the proteins to which they are sensitive. Study XIX has just appeared and concerns the types of streptococci found in asthmatics' sputum. Beside these more fundamental studies there have been interesting reports in studies XII, XVII, and XVIII. In one of these, study XII, Walker concludes that complement fixation and precipitin reactions, using proteins to which the patient is sensitive as antigens, have no value in diagnosis, prognosis or treatment in comparison with the great value of the cutaneous reaction. In study XVII comparison is made between the cutaneous and intradermal methods of applying tests; the results are decidedly in favor of the cutaneous method. The conclusion is that the skin test is specific and separates closely related proteins, that it is sufficiently sensitive and yet not too sensitive. It is a safe index to proper treatment. Treatment gradually decreases the positiveness of the reaction. The cutaneous manner of making the test is easy and does not inconvenience the patient. The intradermal test is much less specific and much too sensitive and cannot be an index to proper treatment. It is more difficult to perform and causes the patient considerable annoyance and discomfort. Study XVIII is on the relation of eczema, urticaria, and angioneurotic edema to proteins other than those derived from food. Walker brings out the fact that horse dander, ragweed pollen, or other pollens may be responsible for an eczema or urticaria associated with asthma, and that these patients are very difficult to treat in an effort to desensitize, as very small doses may greatly aggravate the skin condition. The papers other than the "Studies" that have been published cover very fully the matter of technic and preparation of the test substances, the classification of asthma, and the mode and results of treatment.

In several published papers, [19, 20, 21] Walker has classified bronchial asthma into the anaphylactic type and into the non-anaphylactic type. In the sensitive type are grouped those persons who have asthma during the entire year, due to the proteins of animal emanations, foods, or bacteria, and those who have symptoms only at certain seasons of the year, due to the pollens that are flying at that particular time. In the non-anaphylactic type, whether the asthma continues throughout the year or comes only at certain seasons, the cause is attributed solely to bacteria.

Sex, nationality, and occupation play little part in the factor of sensitization, with the possible exception that bakers are a little more sensitive to the pollens of flour than other persons, and that asthma due to horse dander is more noticeable in those who come in contact with horses, such as farmers and teamsters.

Age is an important factor in the consideration of the patient's history. In persons past forty it is very rare, indeed, to find that protein sensitization is concerned in their asthmatic trouble. The highest sensitiveness in Walker's series was found in 90 per cent, or twenty-seven of thirty patients between the ages of two and five[20].

The preparation of proteins in anything approaching a pure state is a chemical procedure more laborious than is advisable to be undertaken in the average physician's laboratory. The gathering of the pollen is also a somewhat tedious process and necessitates preparation of extracts months in advance of the time of use. For this reason, doubtless, many physicians have believed that while there is much to be learned by this method of testing patients it is beyond the power of the general practitioner to carry out such diagnostic measures. Recently, however, a complete list of proteins ready for use as test substances has been placed on the market, and it is with these that most of our tests were made. The substances are prepared under the direction of Wodehouse so that their reliability is without question.

The technic of the test is exceedingly simple. The patient's forearm is cleaned with soap and water, or alcohol. The skin is wiped dry. A number of abrasions are made through the epidermis with a small scalpel or chisel such as is used in making a von Pirquet test. These abrasions are usually placed five or six in rows

In this way fifteen or eighteen or even twenty-four substances may be tested on one arm, or if a large list of substances is used, both forearms may be covered. Tenth normal sodium hydroxid is a solvent for all the proteins that come in dry form. A drop of this is placed on the abrasion with a wooden applicator and some of the dry protein is removed with the same applicator and mixed with the solution on the abrasion. It is neecssary to use only a small quantity of the protein substance. A new applicator, of course, must be used for every protein. Care must be taken that the protein from one abrasion does not in any way come in contact with another spot on the skin. Usually one of the abrasions is treated merely with the tenth normal sodium hydroxid for a control. Thirty minutes, as a rule, will complete a test. Often in a very few minutes a reaction will be noticed by the appearance of an urticarial wheal, about one-half centimeter in diameter, with an erythema several centimeters across surrounding the central white zone.

We have used, routinely, a rather large list of proteins of the animal emanations, horse dander, horse serum, cat hair, dog hair, and chicken feathers. Of the foods we have used the proteins of meats, cereals, nuts, seeds, and fruits, vegetable and animal foods, milk and eggs. In the list of meats, proteins were derived from beef, pork, chicken, salmon, veal, lamb, lobster, clam, and cod-fish. Milk proteins were whole milk, casein, and lactalbumin. Egg proteins were from the whole egg, egg white, and egg yolk. The proteins of grain in our list included those from wheat, sub-divided into protein of the whole wheat, wheat proteose, wheat glutenin, and gliadin. The difference in these proteins and their specificity of action is taken up in detail in Study IX by Wodehouse. Beside the wheat proteins, tests were made with rye, corn, oats, barley, rice, buckwheat, and flax; among the seeds, beans and peas were the most important, and among the nuts, walnuts, almonds, brazil-nuts, and peanuts. The vegetable foods, including radish, cabbage, carrot, squash, lettuce, turnip, potato, tomato, onion, asparagus, cucumber, rhubarb, and spinach yielded negative results, for the most part. The fruit proteins used were banana, grapefruit, strawberry, and cantaloupe.

Probably the most important group of test substances are the dried pollens. Those in our list are the pollens of ragweed, goldenrod, sunflower, daisy, orchard grass, timothy, red-top, meadow grass, sweet vernal grass, and lilac. We also used as test substances dried bacteria, *staphylococcus pyogene aureus*, and *staphylococcus albus*.

Tests have been made in more than 800 of our cases during the past two years. At one time, a few patients were referred for the test on account of some skin condition, but as a rule no patient was tested unless he was suffering from asthma or hay fever. Of this number, more than 500 were entirely negative in their skin reaction. The reactions of about 100 more were doubtful and a more careful analysis of the history than is undertaken at this time would be necessary to prove that the reaction was of any worth in this group. The remaining patients, more than two hundred in number, had definite skin reactions. While the final study of these cases is to be undertaken by Dr. Fricke-Davis, a cursory review of the results at this time brings out some rather interesting data:

Twenty-eight persons reacted positively to some of the animal emanations. The largest number of reactions was to horse dander; thirteen have a definite history of being unable to go near horses without precipitating an asthmatic attack; four have urticaria, showing further symptoms of their anaphylactic condition. Two patients, entirely negative so far as they knew to the effect of animals on their asthmatic condition, lived on farms so that the history is somewhat doubtful. There were twelve doubtful cases in all; one of these is placed in this group because the asthma came on after the patient was 50, although he insists that he had not ever been able to handle horses. Four of this group affected by animal emanations were definitely sensitive to chicken feathers; one of these is also included in the group sensitive to horse dander. Three of the patients sensitive to chicken feathers might also be included among the food asthmatics, as they were extremely sensitive to egg white, egg yolk, and whole egg, and found it imperative to leave these substances out of their diet.

One hundred persons reacted to one or sev-

eral of the proteins derived from foods. Of the ten different proteins derived from meats which were used as test substances from six to three hundred fifty-five times there were very few positive reactions, thirty in all. In none of these could meat be definitely assumed to have any bearing on the condition, with the exception of the egg anaphylactic patients sensitive to chicken feathers who also, for the most part, could not eat the meat of chicken. The animal foods, milk and egg, were used hundreds of times and were positive only a few times. The greatest number of reactions was to egg white; eleven patients in all were sensitive to this protein. Whole egg and egg yolk were each positive six times. There were no reactions to whole milk; casein was positive only twice, and lactalbumin only three times. In fact, milk seemed to play no part in the asthma in children whom we saw.

Twenty-five patients had marked positive reactions to grain. Ten of these, however, must be considered doubtful, three because of their age, and the other seven because of the repeated attacks of bronchitis which made it seem that infection was probably the chief factor. There were, then, fifteen definite cases in this series. Three of these were of children whose food seemed to be the disturbing element. Two persons were very sensitive to flax; they are grouped here among the grain sensitive. The remaining persons gave histories which made it seem likely that they were sensitive to the proteins of cereal foods. Wheat proteose is the most common offender of the cereal group, although rye may give as many reactions. Rice occasionally gives definite reactions. We had one domestic who was sensitive to the whole group and found difficulty in eating "war bread" and in handling the ingredients for making it.

There was a large number of patients, twenty-eight in all, sensitive to vegetable proteins. This group on the whole is negative; Wodehouse pointed out in one of his papers that there is very little protein matter in vegetables, except in roots and tubers. Potato contains a considerable amount of protein. Two persons were probably affected by this substance. One man in particular was reported as being markedly improved for months by leaving potato out of his diet.

Fruits, apparently, have little to do with asthma. In several instances banana gave marked reactions. Twice it was known to be a definite factor in producing asthma. One history was most interesting. This patient was seen five years before the present technic was in vogue. A crude method of testing her sensitiveness to this food was tried. An extract was made and what was thought to be a small dose was injected intradermally. A similar extract of raw potato was used as a control. In fifteen minutes the patient developed an urticarial wheal as large as a dollar about the site of the injection of banana extract and simultaneously became afflicted with a most severe attack of asthma. This left no doubt about the patient's having anaphylaxis for this fruit.

In three hundred sixty-five tests to *staphylococcus pyogenes aureus* and *staphylococcus albus* there was not a single reaction. This is at variance with Walker's findings[15]. Specific strains probably should be used instead of stock strains as test substances. Among the large number of negative results that we have obtained, infections surely play a large part in the cause of this respiratory affliction.

Because of the very definite results obtained the most interesting group is made up of those persons sensitive to pollens. As is known by the profession generally and also by the laity, ragweed pollen is a definite cause for so-called "hay fever." This has been facetiously termed "a rich man's disease," as change of climate is the popular method of treating the affliction. Probably the most serious factor in hay fever is the tendency for the patients ultimately to develop asthma. It must be remembered that all seasonal coryzas are not of necessity hay fever. In fact, there is doubtless a large proportion of "colds" of an epidemic nature during the hay fever season that may be mistaken for this specific anaphylactic disease. Twenty-two patients in our group were sensitive to no pollens but ragweed; four of these were doubtful cases, twelve had hay fever only, while six had hay fever and asthma. We had one patient who was sensitive only to the pollen of goldenrod. This probably was not a definite reaction as

her hay fever was contracted in India and she knew positively that the dahlias growing wild on the hillsides were the offenders. Goldenrod when it reacts probably is an evidence of a group reaction rather than a specific cause of the trouble. Goldenrod was coupled with ragweed in sixteen other cases. Only one of these need be considered as doubtful. Eight had hay fever alone while seven had both hay fever and asthma. The history of these sixteen patients with positive reactions pointed chiefly to ragweed as the cause. Two of the patients of the series also had an urticaria complicating their sensitive condition.

Beside the group just mentioned there were thirty-one other patients sensitive to ragweed in addition to other substances; eleven of these were doubtful; and one of these classified as doubtful while probably sensitive to ragweed as a cause for hay fever, was proved to be sensitive to an insect powder manufactured by a concern of which he was the sales manager. Contact with the powder in the factory precipitated his attacks of asthma, and his skin was markedly sensitive to the substance which was not irritating to a normal epidermis. The remaining nineteen patients at all sensitive to other substances were undoubtedly afflicted chiefly by ragweed.

In summary of the groups sensitive to ragweed and other fall pollens fifty-two cases, in all, were definitely positive, thirty-six with hay fever and sixteen with both hay fever and asthma.

Twelve persons were sensitive to summer pollens. Eight of these patients had a definite summer hay fever beginning at the time that timothy pollenates. In two the histories were doubtful. In the other two the summer and fall pollens were both responsible so that the patients began in the summer with hay fever due to the timothy pollen and continued through until frost killed the ragweed.

The discussion of the treatment must be reserved for the later report by Dr. Fricke-Davis. Walker's reports on his own series are clear, however, and in the main the findings in our few cases are coincident with his statements. The persons sensitive to animal emanations become desensitized for a considerable period by repeated injections of safe but increasingly large doses of the offending protein.

The cases of persons sensitive to food proteins are difficult to handle. Attempts to desensitize have not met with marked success, and careful elimination from the diet of the offending substances seems to be the chief method of control.

The persons sensitive to pollens offer more promise in the way of treatment. Desensitization as outlined by Walker in a recent paper may be carried out either before the season commences or during the season. By far the best method is to begin at least twelve weeks before the earliest date of pollenation, starting with a dilution less than that which will give a positive skin reaction and gradually increasing the dose until a few tenths of one cubic centimeter of a 1 to 100 extract may be injected subcutaneously. Injections are given at weekly intervals so that a patient by beginning in May may receive twelve such injections before the advent of the autumnal hay fever season. If treatment is instituted during the season, great care must be taken or further reaction may follow. At times, asthmatic attacks may be relieved by such treatment, but results are not so satisfactory as with the pre-seasonal method. A very few patients have been treated at our hands by means of dilutions of the pollen extracts. The patients who have hay fever early in the summer who were so treated received no relief, possibly because treatment was not instituted until the season was advanced. Some half-dozen patients treated before the autumnal season have this year experienced marked relief from hay fever and one has escaped asthmatic attacks, that, too, in a season reported as being exceptionally rich in pollen.

In conclusion it may be said that in spite of the many negative tests that have been made in comparison with the small number of positive results, we still believe that there is something to be learned from this diagnostic method, and that more care in obtaining the patient's history and the careful selection of the type of case to be tested will result in less unnecessary work. It would not seem necessary to test persons to the proteins of the animal emanations unless there is a definite history suggesting an asthma due to this type

of sensitization. The tests are sharp and the number of persons in this group is very small. It would seem unnecessary to use a large number of food proteins in testing asthmatics. A few of the cereals and potato as the chief vegetable would include practically all the food proteins that would react positively in a routine examination of asthmatics. The persons sensitive to pollen form the largest group prominent for positive reactions and their histories will practically always decide the type of person who is to be tested to the extracts of the various weed pollens.

It should not be forgotten that asthma that develops after the age of 40 is very seldom due to a protein sensitization. A very large group of asthmatics remains in whom the subject of infections should be considered most carefully.

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PROTEIN SENSITIZATION IN BRONCHIAL ASTHMA AND HAY FEVER*

By Chas. N. Hensel, M. D.
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Up to five years ago the Medical Profession was without any adequate scientific conception of the etiology of asthma. Today, in the theory of protein sensitization as applied to asthma, we have a definite etiological classification in approximately fifty per cent of the cases seen clinically in practice. And with the skin test, of which we will later speak in detail, we have an adequate procedure which not only removes the diagnosis from the field of chance, but shows accurately the degree of sensitization and points the way to definite progressive treatment.

Hay fever had received a great deal of scientific study. Dunbar, in 1903, determined that the hay fever in Europe was dependent chiefly upon a protein substance found in the pollen of most grasses, while in America it was due chiefly to the pollen protein in the compositae family of which ragweed was the chief offender.

It was Wolff-Eisner, in 1906, who first called attention to the fact that the disease was due to the anaphylactic action of these pollen proteins upon hypersusceptible individuals.

Dunbar believes this but, in addition, thinks there must be an abnormal penetrability of the skin and mucous membranes for the pollen substances. He has shown that a solution of pollen toxin dropped into the eye or upon the skin of a hay fever patient produces a severe reaction, while in normal individuals no such reaction occurs.

In 1911 Noon, and later Freeman, in England found timothy pollen as a cause of hay fever in a majority of cases and had some success in treating with timothy pollen toxin.

Goodale of Boston, in 1914, extended these observations to cover a wide range of plant pollens, from those of trees flowering early in the spring to the roadside plants blooming late in the fall.

While he found a scattering sensitization to almost every variety of pollen, his important results were that timothy and June grass pollen caused the majority of the early summer cases of hay fever while ragweed was responsible for the majority of the cases occurring in the late summer and fall.

Instead of using the ophthalmo-reaction of the earlier investigators, Goodale applied the cutaneous method so well known in the diagnosis of tuberculosis. This procedure permitted a number of determinations to be carried out at one time as well as being more acceptable to the patient.

This historical review brings us up to the work of Walker which commenced sometime in 1915. His studies covered both hay fever and asthma and he has expanded and amplified our knowledge very materially.

Much of what I shall have to say in the balance of this paper is based on Walker's work plus three years' experience of my own.

Method of Procedure

Vaughan has shown that when a foreign protein enters the body parenterally, i. e., outside the digestive canal, it stimulates the body cells and they produce specific proteolytic ferments which will digest this protein; when this has occurred the body is sensitized to the foreign protein. When this foreign protein is again introduced into the body the specific proteolytic ferments proceed to split it up, liberating a non-poisonous and a poisonous molecule. It is these poisonous molecules accumulating too rapidly for absorption that causes the anaphylactic phenomena.

Since it is agreed that it is the protein element when parenterally introduced which

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causes the state of sensitization, and since proteins are widely distributed in nature, we must not be surprised to find these proteins coming from many different sources and entering the body in different ways.

The proteins may enter the body chiefly then through three different channels, i. e., inhalation, ingestion, and infection. In the inhalation type there are four sources, namely—

1. animal hair and dandruff
2. pollens
3. flour—bakeries and mills
4. dust—coffee roasting

In the ingestion type there is but one source, namely, food. The chief food offenders in order of importance are—

1. cereals—wheat, corn, rice, rye.
2. eggs.
3. fish—lobster, salmon, mackerel, cod.
4. casein.
5. beef.
6. chicken.
7. cocoa.

In infection we have as a cause autolysis of bacterial proteids coming from any septic focus in the body such as respiratory infection, foci in sinuses, tonsils, teeth, gall bladder or elsewhere in the gastro-intestinal tract.

Walker's percentage of the various causative factors is interesting in this connection. He found of all the asthmatics who proved sensitive, 20 per cent were sensitive to horse dandruff, 15 per cent to wheat, 15 per cent to staphylococcus pyogenous aureus, 15 per cent of early pollens, 10 per cent to late pollens, 5 per cent to cat hair, 3 per cent to staphylococcus pyogenous albus, and 17 per cent to miscellaneous proteins.

Technic of Skin Tests

A number of small cuts 1/8 of an inch long are made on the flexor surface of the forearm with a sharp scalpel, not deep enough to draw the blood yet deep enough to penetrate the skin. A sufficient number is made at one time for all of the proteins to be tested, and an extra one allowed for a control. On each cut is placed the protein to be tested and to this is added 1 drop of 1/10 normal KOH solution to dissolve the protein and permit its rapid absorption. At the end of a half hour the proteins are washed off and the reactions are noted, always comparing the inoculated cuts with the normal control on which only KOH solution was placed.

A positive skin test consists of a raised white elevation or urticarial wheal surrounding the cut with a small or large zone of hyperemia extending beyond the elevation. Sometimes there may be a good sized area of hyperemia without any elevation of the skin. Often there is considerable itching of the skin.

The smallest reaction that can be called positive must measure 0.5 cm. in diameter and any smaller reactions are called doubtful. It some times happens that all of the cuts, even the control, may show a slightly positive or plus-minus reaction. This is especially true in cases of long standing and in middle aged individuals with chronic bronchitis and bronchiectasis. Consider these cases all negative.

A negative skin test with a certain protein rules out that protein as a cause of the asthma or hay fever, and, conversely, all proteins which give a positive skin test should be suspected as causative factors.

As pointed out earlier in the paper, these reactions are absolutely specific. A patient who is sensitized to the protein of horse hair and dander will not react to the wheat protein and vice versa; also as long as this patient is sensitive to horse dander he will always give a positive skin reaction to horse dander.

Scheme of Determining Causative Agent

When an individual comes to you complaining of asthma or hay fever ask him when he has it. If he replies that it is strictly seasonal we infer that it is probably due to some of the pollens. If this season be early summer it is due probably to the pollen of timothy or red-top grass and we make the tests with these. If the season be the late summer and early fall the sensitization probably is due to ragweed pollen. The ragweed season in this section of the country commences about the 10th to 15th of August and lasts until frost. The date of onset varies with the condition of the season. This fall type is also caused occasionally by the pollen of goldenrod, golden glow, sunflower and daisy, but these all belong to a compositae class and skin tests with ragweed usually suffice.

Next inquire into the relationship that colds

and respiratory infections bear to the onset of the symptoms. If a close relationship exists, disregard the inhalation and ingestion types and look for bacterial causes in the sputum and nasal secretions. This type is likely to occur in the spring and fall during the wet changeable weather. These cases usually respond to autogenous sputum vaccines which either contain staphylococcus pyogenes aureus, occasionally albus, or the diphtheroids.

If the investigation is so far negative inquire whether the symptoms are more or less constant throughout the year. If this be admitted, consider the possibility of the protein being in the form of some emanation from the domestic animals, i. e., hair and dandruff of horse, dog or cat, the dust from chicken feathers or the dust from woolen blankets and pillows. Walker had one case due to sleeping on a feather bed and two cases from sleeping on feather pillows.

If we get an admission of this type we make the tests with alcoholic extracts of horse, dog, or cat-dander, chicken feathers or wool.

Our next inquiry is as to the relationship of the asthmatic attacks to the ingestion of food. This food type occurs usually in younger people and in them one usually gets a history of eczema; therefore, if your patient has eczema be sure to investigate the foods. Many of these food cases have a natural unexplained dislike for certain foods or else know definitely that certain foods cause the attacks. This is particularly true of eggs.

According to Walker one-half of the food cases are sensitive to protein in cereals, and of these, wheat is the chief offender causing probably 70 per cent of all the asthma due to cereals. Corn, rye and rice scattered along make up the balance. Eggs are next to wheat in importance. Then comes fish, of which lobster and salmon are the usual sensitizing substances. Potatoes are quite often a cause; and at the end of the list we find milk, beef, chicken and cocoa. There have been some cases reported as sensitive to grapenuts—again a cereal. If all of these are negative it is unlikely that the other more occasional articles of diet are causative factors.

Talbot has shown a few cases of asthma in children as due to the protein of different nuts, but his chief findings were egg albumen in the majority of cases, with cereals second and milk third.

If all of the above causes have been investigated and been found negative then look for some source of chronic infection, i. e., sinusitis, septic tonsils, pyorrhoea and abscessed teeth, or any infection along the gastro-intestinal tract.

If the patient states that his asthma began after the age of 40 he is usually not sensitive to anything. These are cases of cardiac asthma, cardiorenal disease and aneurysm of the aortic arch, chronic bronchitis and bronchiectasis. If you can get some of the sputum from these latter cases and make a vaccine from the predominating organisms present and treat with this vaccine plus the giving of KI, you may get improvement, but these are usually very unsatisfactory cases to handle and are much more comfortable in a warm, dry, equable climate.

In contrast to the older cases just referred to, the younger patients are much more likely to show sensitization to some protein, and in consequence the treatment is more often beneficial.

Up to five years of age, roughly 90 per cent are found to be sensitive to some foreign protein. This proportion decreases gradually until with cases beginning after 35 years only 23 per cent were positive to foreign protein.

Multiple Sensitization.

Multiple sensitization appears to be much more common in those who began having asthma during infancy and up to 10 years of age. If the onset occurred after the age of 10 multiple sensitization is quite rare. It follows apparently that sensitization to one protein early in life is apt to increase foreign protein sensibility and the patient acquires sensitization to other proteins as well. As an example we find a patient sentitive to several foods, to horse dandruffs and to pollens.

In handling these cases of multiple sensitization the best plan is to omit all foods giving positive reaction for at least one month, believing that total abstinence from the offending protein for a long period automatically desensitizes for that protein. In addition, de-

sensitize with horse dandruff protein and also pollen protein.

Methods of Preparing Proteins for Tests.

A handful of uncleaned horse-, dog-, or cat-hair mixed with dander is put into a bottle of 12 per cent alcohol, corked and left from 3 to 4 days. The alcohol serves to sterilize the solution and extract the protein. This solution is filtered and kept corked in brown bottles for the tests.

Crude pollen extracts can be made in the some way by soaking the blossoms containing the pollen in a 12 per cent alcoholic solution, though now a number of commercial houses are placing pollen extracts on the market for skin tests as well as for treatment.

The foods can be applied to the skin in the form in which they are consumed, i. e., a little beef juice, a little of the juice squeezed from canned salmon, the white of an egg, a little juice scraped from the cut surface of a potato either raw or cooked, a drop of milk applied to the scratch. The cereals may be applied in the form of flour moistened with a drop of 1/10 normal KOH since most cereal proteins are both water soluble and alkali soluble.

Walker says that many patients who are sensitive to wheat will not react to the crude flour test but have to be tested with the individual proteins extracted from the wheat, such as globulin, leucosin, glutenin, gliadin, etc. My own experience has borne this out, but so far I have not had the individual proteins available for tests though I have a number of cases that showed a definite reaction to the crude flour tests and were apparently relieved by withdrawal of that food from the diet. One or two of the chemical houses are beginning to put these proteins on the market.

The bacterial proteins are obtained by growing on agar, washing, centrifugalizing with saline, then 3 per cent phenol in absolute alcohol and finally with ether, leaving a dry powder for tests.

Treatment.

For the bacterial causes, remove foci of infection and treat with autogenous or stock vaccines, beginning with a small dose, i. e., one hundred million and increasing gradually, i. e., fifty million at 7- to 10-day intervals.

For food causes, remove the food from the diet. Desensitization has been tried and is very unsatisfactory. Heating to the ordinary cooking temperatures and prolonged boiling do not destroy the anaphylactogenic properties of wheat. But, as shown by Wodehouse, the extraordinarily high temperatures employed in making the prepared cereal foods such as "puffed wheat", "puffed rice," "Kellogg's Toasted Wheat Biscuit," "Shredded Wheat," etc. seem to render these cereals harmless. Consequently these cereals may be allowed in the diet in this form in sensitive cases who cannot take them in any other form.

For animal emanations, give away the dog and cat, get rid of the feather beds, avoid horses if possible; if not, desensitize.

There are two proteins in horse dandruff—the alkali meta-protein and the peptone. Different individuals vary widely in their sensitiveness to these two proteins so that both must be used in testing, and treatment followed with the protein causing the severer reaction—usually the alkali meta-protein.

The horse dandruff proteins for treatment are made up in dilutions of from 1-100 up to 1-1,000,000. These various dilutions are placed on the skin cuts on the forearm and the character of the reaction noted for each dilution. Treatment is begun with the dilution just weaker than the one that gave the smallest positive reaction, gradually increasing the strength of the inoculations up to 1-100 dilution.

For the pollens, after having determined the particular pollen to which the patient is sensitive, we must begin treatment as in the horse cases, with the dilution weaker than the one to which the patient was sensitive and gradually increase the strength of the dilution at 5- to 7-day intervals, always avoiding a reaction, which delays the treatment and throws us back to a weaker dilution.

To give an illustrative scheme of treatment, we will suppose that the patient gives a more or less positive skin test with a 1-10,000 dilution. Then begin with a 1-100,000 dilution and give 0.2 cc.,

next 1-10,000 dilution give 0.2 cc., 0.3 cc., 0.4 cc.
next 1-5,000 dilution give 0.2 cc., 0.4 cc.,
next 1-1,000 dilution give 0.2cc., 0.3 cc., 0.4 cc.,

next 1-500 dilution give o.2cc., o.3 cc., o.4. cc., next 1-100 dilution give o.1 cc., o.2 cc., o.3 cc. Each dose to be given at weekly intervals and never oftener than every 5 days. This takes 15 treatments at 5-day intervals, which would necessitate 2½ months, so have your patient report at least three months before the expected onset of the season.

In conclusion, I wish to state definitely that the procedures above outlined reveal sensitization in only approximately 50 per cent of all cases of asthma tested. That those not found sensitive must be treated by the recognized standard-methods of proven clinical value.

As for those cases showing sensitization, satisfactory results have been obtained in my experience in a little over half the cases treated. Where desensitization has not been completely accomplished it has been of great value to the patient to know absolutely the source of this asthma so that he could avoid it.

Asthma patients associate their attacks with cold air, dampness, changeable weather, winds, menstruation, indigestion, nervous irritability, colds and bronchitis. After finding the offending protein and either removing it or treating with it, these patients become tolerant to these conditions and do not develop asthma when exposed to them.

Finally, I wish to express my obligation to Dr. Walker for advice, encouragement, personal communications over troublesome points as well as for furnishing test solutions from his own laboratory.

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(Discussion papers of Drs. Hensel and Sanford)

DR. H. L. ULRICH, Minneapolis: Mr. Chairman, Members of the Association: The subject of protein sensitization has such various aspects and presents so many differences to different observers that it is douhtful just where to begin in a discussion of the suhject. One point to be emphasized is that these things must be considered as true anaphylactic phenomena. The manifestations are manifestations of a general susceptihility. This is not accepted hy some ohservers because they have not been able to produce these phenomena in a passive way, such as we are able to do with an animal anaphylaxis.

In the last Journal of the A.M.A. there is the history of the transference of susceptibility to horse dandruff. A case of primary anemia was transfused with 600 c.c. of hlood and two weeks afterward, while riding behind a horse, he suffered a severe attack of asthma. On going back to the donee they

found that he had suffered for years with asthma and that he was very susceptible to horse dandruff. That is an example of the practical transferencc of susceptibility.

The idea of testing out the skin reaction for bacterial reactions is not entirely new, although we owe a great deal of thanks to Walker for showing us these cases. Many years ago I reported to this Society the skin test for typhoid fever.

The point I wish to bring out is that in these diseases from the seventh to the tenth day you are liable to have skin reaction, and as the disease grows older you are liable to have more. In the cases reported by Cook and Van ? ? ? some years ago they showed that sixty to eighty per cent of the community are sensitized to foreign proteins and the common things are the focal infections found so frequently. I emphasized this last week that our focal infections are the common sources of these things, and this is pushing our clinical results nearer to the results we are looking for. We have bacterial infections and bacterial protein pathology and the common manifestations soon in our clinic are the protein manifestations. Most of the clinical cases—I have not proven it out, but feel sure that most of the clinical cases can be shown to be due to protein sensitization. Our urticarias, our pyloric spasms, our spastic constipation, our albuminurias, are all due to protein sensitization and to no other cause.

DR. W. W. HERRICK, Columbia University, New York: Mr. Chairman, Gentlemen and Ladies: It is a great privilege to be here with you members of the profession of Minnesota, and I thank you for allowing me to come.

This application of the phenomenon of Theobald Smith to practical clinical medicine has been one of the most recent developments to the general practitioner. There are two or three things which might be brought out. In the first place, where can one get standard proteins prepared in a scientific manner? I do not wish to seem to be an agent for any chemical house—I am not, but I do know that the work of the Arlington Chemical Company of Yonkers is on a very good basis and their products are worthy. The experts of this Company employ the simple incision rather than the ordinary von Pirquet test.

The examples which have come to my notice are those not only of the ordinary animal and food proteins, but of the feather proteins. My friend, Dr. Evans, of New York, was telling me of a consultation with another physician. The patient, a woman, had had asthma for eight years. During the consultation Dr. Evans heard a large parrot scream in the next room and he asked the woman how long she had had the bird. She said that she had had it for eight years. The idea occurred to Dr. Evans that the parrot might be the cause of the asthma. A test was given and a very pronounced reaction followed, and that did away with the parrot. Another case was that of canary birds. The patient had asthma only in town and she had canary birds only in town. A test gave a very pronounced reaction to canary bird feathers. That shows how careful we have to be in testing for this protein sensitization. That is a very valuable work for the general practitioner and for all of us.

I regret that I did not come in in time to hear the entire discussion.

DR. ROOD TAYLOR, Minneapolis: Mr. Chairman, Gentlemen: In view of the statements that asthma which begins in early life shows a much larger proportion of protein sensitization, I looked over, yesterday, the record of twenty-five cases of hay fever and asthma in childhood, which have come to me this year. Sixty per cent of these began to have asthma before the second year, some before the third year and some before the sixth. Sixty per cent showed protein skin tests. Fully one-half of the cases were infections, following whooping cough, pneumonia, etc. The non-sensitization cases were quite definitely different from the sensitization cases. During the paroxysm there seems to be as much inspiration spasm as expiratory spasm, which is not so true of the protein cases which are usually of the purely expiratory type. There is a great difference also in the degree of eosinophilia in the sensitization and non-sensitization cases.

I would like to say a word about the case which Dr. Ulrich reported from the Journal of the A.M.A. In the last sentence of that report there was a statement that another case had been previously transfused by the same patient that was sensitive to the horse dandruff but had not suffered with any symptoms whatever.

DR. C. N. HENSEL, St. Paul (closing): Mr. Chairman, Ladies and Gentlemen: It has been a pleasure to hear Dr. Sanford's paper and to know that his experience parallels my own.

The thing of greatest value in this procedure is that it is a practical plan and easily put into operation. In the old days we thought these people were sensitive to chicken feathers, to milk and eggs, etc., but we did not definitely know. Now we can find out whether they are sensitive or not.

In the case of a doctor's child who had been taken off milk and eggs according to the customary teaching but continued to have attacks of asthma and be very thin and under-nourished, cutaneous tests showed that he was not sensitive to milk or eggs but was sensitive to horse dandruff. Milk and eggs were put back in his diet and he was desensitized to horse dandruff and is growing and developing into a healthy boy. Formerly he was so sensitive that if he bought peanuts from a horse-drawn peanut wagon he would have an attack of asthma.

As for foods, cocoa in my experience has been a more frequent cause than has been reported by Walker. Potato, too, is not an uncommon cause especially in adults, occasionally in children: I have had several cases who could not eat beef at all. A girl of eighteen who had had asthma since the age of

8 years and had been in the University Hospital repeatedly, had her sinuses washed out, turbinates trimmed, tonsils removed, etc. She would stay in the hospital a few weeks and be all right, but on going home the asthma would return. She got a good deal of benefit from calcium lactate, but even then would occasionally turn up with an attack of asthma. Then I tested her out, found that she was sensitive to beef and she has had only one attack of asthma since, and that followed eating a piece of beefsteak.

One patient who was supposed to have year-around hay fever was markedly sensitive to wheat, corn and rye, and slightly so to barley. Removal of these cereals from her diet caused the symptoms to disappear and she gained 15 pounds.

As for the grasses, timothy and red-top are the chief ones to consider. I have had only one case sensitive to goldenrod alone.

As to eosinophilia, I have asked the people at the Brigham Hospital and they say that in some nonsensitive cases they have obtained a typical eosinophilia, while in some sensitive cases it was absent. It is not always a factor.

The case of the sensitization to parrot feathers reported by Dr. Herrick is very interesting.

Walker reports the case of a woman sensitive to dog hair who refused to give up two pet lap dogs; he desensitized her and she kept her dogs.

DR. A. H. SANFORD, Rochester (closing): Mr. Chairman, Gentlemen: I do not know that there is much to add except to reiterate Dr. Hensel's statement that we are not justified in treating asthma empirically, and without first going into this subject as to whether the patient may not be sensitive to some specific protein. In hay fever I do not think it is justifiable to treat all hay fever patients in the same way. Even though the patient says he has hay fever, he should be treated with extracts and tested out until we find whether he is sensitive to the various things.

THE COLLOIDAL GOLD AND OTHER CEREBRO-SPINAL FLUID REACTIONS*

By CHARLES E. NIXON, M. D.
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The introduction of lumbar puncture into clinical use by Quincke in 1891 marked a very distinct advance in diagnosis, prognosis, and therapy. It is a relatively simple procedure, and harmful, or even unpleasant, effects rarely result from its employment if ordinary care and judgment are used.

Examination of the cerebrospinal fluid is definitely indicated in cases where there is any suggestion of neurosyphilis, but it is of value, positively or negatively, in every neurologic condition.

Spinal puncture is contraindicated in cases of brain tumor, especially if the neoplasm is situated subtentorially.

At the time the fluid is withdrawn its color and pressure are noted. Normal cerebrospinal fluid is clear and colorless. In certain types of meningitis the fluid is cloudy; in cases with spinal cord compression the fluid may be yellow, with or without massive coagulation. After cerebral hemorrhage where blood has become mixed with cerebrospinal fluid, the fluid has a bright red color; later a yellowish discoloration occurs.

The pressure of the spinal fluid in normal individuals in the recumbent position varies from 40 to 90 mm. of water in a child and from 125 to 175 mm. in older children and adults.

Any pathologic process causing an increase in the production or a retardation of absorption of the fluid is accompanied by an elevation of the pressure. In the various forms of meningitis the pressure ranges from 300 to 800 mm. of water. Some increase of pressure is usually found in cases of cerebrospinal syphilis.

The tests that are of definite clinical value are the Wassermann complement fixation test, the Nonne or other tests for increased globulin or globulin and albumin, the cell count and the colloidal gold reaction. Of these, the colloidal gold test is the most valuable as the following comparative study of these reactions in various diseases will show.

In dementia paralytica a colloidal gold curve is obtained in at least 95 per cent of the cases; in untreated cases the reduction commonly occurs in zone I, giving a so-called "paretic curve."

The Wassermann test is positive in about 90 per cent of the cases and an increased globulin content is present in 85 per cent. A pleocytosis, that is, a cell count of six or more, is found in 70 to 75 per cent of the fluids from paretics. The average cell count in paresis is between 35 and 40 cells per cubic millimeter.

In tabes dorsalis the colloidal gold reaction is present much more frequently than any of the other tests. In about 10 per cent of the cases

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it is the only positive reaction. A curve is obtained in 80 per cent of the cases, whereas a positive Nonne and a pleocytosis occur in less than 50 per cent and a positive Wassermann in about 55 per cent of the fluids.

Well marked curves may be found in early cases. In patients with suggestive clinical evidence of tabes dorsalis but whose cerebrospinal fluid is entirely negative, a positive gold reaction is sometimes brought out by the administration of arsphenamine for several weeks accompanied by spinal drainage. In these cases the colloidal gold is the first reaction to appear.

The importance of the colloidal gold reaction in diagnosis is strikingly shown in a study of a series of fluids from patients with cerebrospinal syphilis; 85 per cent of the fluids gave some reduction, and 75 per cent showed definite curves. On the other hand, the Nonne reaction was positive in 63 per cent and definitely positive in only 41 per cent; there was a cell count above 5 in 45 per cent and above 9 in only 31 per cent. In 18 per cent of the cases the colloidal gold was the only reaction that gave evidence of a pathologic condition of the cerebrospinal fluid.

Of conditions other than neurosyphilis and meningitis giving a well marked curve, multiple sclerosis is the one most frequently met. About half of the fluids from cases of disseminated sclerosis gave a definite reduction. Many workers have reported curves in Zone I as being most frequent in these cases but our experience is that the reduction more commonly occurs in Zone II. The Nonne is positive in only a small percentage of the cases,—about 10 per cent in our series. The finding of an average cell count of 14 in multiple sclerosis, as against 1.6 in normal fluids, is interesting in that it tends to confirm the theory of a toxic etiology in this disease.

Fluids from patients with cord or brain tumor give a reduction in 50 to 60 per cent of the cases. The reduction commonly occurs in Zone III but is differentiated from meningitis by the fact that the Nonne is usually negative or faintly positive and the cell count is relatively low or normal, while in meningitis a strongly positive Nonne and a high cell count accompany the curve.

In considering the comparative worth of the various tests used in the clinical study of the cerebrospinal fluid it must be borne in mind that each test depends on a different substance in the cerebrospinal fluid and is indicative of a more or less specific reaction on the part of certain tissues of the nervous system. While there tends to be a rather definite relationship between the fluid reactions in the various types of pathologic processes, it is not uncommon to find one or more of the tests positive with the others negative. For this reason a serious error in diagnosis may be made by failure to make use of all those tests in every spinal fluid studied.

These reactions are not specific in the sense that each denotes a definite etiological factor, for many conditions will cause increased globulin and albumin in the cerebrospinal fluid; the same is true of the varying degrees of pleocytosis. The terms applied to the colloidal gold curves, "paretic," "luetic," and "meningitic," indicate the belief that these curves are diagnostic of the conditions named; but the fact that so-called "paretic" curves and "luetic" curves are found in multiple sclerosis and other non-luetic lesions, and that a "meningitic" curve may be provoked by a tumor or myelitis, is proof that these reactions do not depend upon a single provoking substance. While emphasizing the non-specificity of the various colloidal gold curves, it is our experience that they are of very definite diagnostic value if corroborated by or corroborative of any other reactions or clinical findings; thus, a reduction in Zone I usually indicates dementia paralytica, in Zone II, cerebrospinal lues or tabes dorsalis, and in Zone III, meningitis.

It is apparent that a definite diagnosis should not be made upon the presence of one of these reactions; however, any distinct abnormality of the cerebrospinal fluid indicates a pathological condition of the central nervous system. Further, even a slight reduction of the colloidal gold is suggestive of involvement of the nervous system and a curve of any magnitude is definite indication of such a condition.

The spinal fluid tests are of relatively little value in indicating improvement of the patient under treatment, for the degree of reaction in these tests does not definitely parallel the clinical course. A fluid may be entirely negative or faintly positive at the beginning of treat-

ment and later show strongly positive reaction; at the same time the patient may give marked clinical evidence, subjectively and objectively, of betterment. The cell count varies from time to time with or without treatment and, in our experience, fluids showing pronounced colloidal gold curves do not change to any marked degree under treatment.

The colloidal gold reaction, while requiring a careful technique, has been simplified by careful workers until it is within the reach of any routine laboratory. It is unquestionably the most sensitive and valuable of the various tests used in the study of the spinal fluid. It does not take the place of any other test or make a careful neurologic examination unnecessary, but does have a definite and independent value and no examination of the spinal fluid is complete without it.

As Fildes, Parnell, and Maitland, and Wiles & Stokes have pointed out, the spinal fluid may give evidence of involvement of the central nervous system early in the course of the syphilitic infection. Since early treatment is of such vital importance in neurosphilis, it is essential that every case of general syphilis, especially with any objective signs of nervous system involvement, should have a complete study of the spinal fluid together with a careful neurologic examination.

Summary

1. The colloidal gold is the most delicate of the routine spinal fluid reactions.

2. It does not replace any other test but, on the other hand, is of independent value.

3. It is of special importance in the early diagnosis of neurosyphilis.

4. The various curves are not specific but are of great diagnostic value in conjunction with other clinical and laboratory findings.

5. A colloidal gold curve may be obtained with or without other positive findings after provocative treatment.

6. The colloidal gold curve does not parallel clinical signs or give definite evidence of improvement under treatment.

7. Cases with no involvement of the central nervous system give no colloidal gold curve.

8. Clear cut clinical cases of tabes dorsalis may show all the spinal fluid reactions negative both before and after treatment.

9. A curve in Zone III with a negative cell count and negative or faintly positive globulin is strongly suggestive of a brain or cord tumor or myelitis.

10. Curves in Zones I and II may be found in non-luetic conditions such as multiple sclerosis and brain abscess.

11. A cell count above 5 is pathologic but this count is of no value in indicating duration or severity of the process or improvement.

*For a more complete treatise of this subject see "Colloidal Gold Reaction and Its Clinical Interpretation," by Warwick and Nixon, in Archives of Internal Medicine, February, 1920.

COLLOIDAL GOLD REACTION*

By Margaret Warwick, M. D.
Minneapolis, Minn.

It was not until 1912 that Lange first presented the colloidal gold reaction on spinal fluid. This has since borne his name as well as the more common term "gold-sol" reaction. In the comparatively short time which has elapsed since its advent, there has grown up on the subject a voluminous literature which has served to give the reaction a definite and well deserved place among the tests used as an aid in the diagnosis of affections of the central nervous system. Further elucidation or discussion of the test may serve not so much for its justification as for a wider interpretation and broader understanding of this reaction and its relation to clinical symptoms.

First of all in the study of any test, one must consider the allied reactions. For globulin the Nonne was most commonly used. This is done by mixing equal parts of saturated ammonium sulphate solution and spinal fluid. A white cloud or opalesence appearing in three minutes means an increase of globulin. More recently the Ross-Jones ring test, a modification of the Nonne, has also been employed. This consists of layering 1 cc. of spinal fluid upn 1 or 2 cc. of a saturated solution of ammonium sulphate. A white or grey ring marking the point of contact of the two fluids constitutes the positive reaction. This has proved in our hands to be the most satisfactory globulin test. It is sharp, clear cut, easily read and not often

*Read before the Minnesota State Medical Meeting, Oct. 1, 2, 3, 1919, Minneapolis, Minn.

confused with a slightly opaque containing tube as is the Nonne.

Text books and observers frequently differ as to the cell count to be considered as pathologic, the common view, however, being that any number below ten is normal. Many writers feel that this is too high a limit. In our series, there was not a single count of over five cells in a nonsyphilitic or non-neurological case and the average was 1.6 cells in our normal spinal fluids. From this fact as well as the findings of others, we believe that five should be the upper limit of the normal cell count.

But it is in the preparation of the colloidal gold solution that every laboratory worker, whether amateur or experienced comes to grief sooner or later. Most authors agree that a constant standard solution cannot always be made, and that skill consists in ability to recognize and remedy the faulty solution. After months of success, one is sometimes suddenly confronted by a so-called protected solution or more rarely, a hyper-active solution which gives the right curve, but produces it with unusual rapidity and exaggerated color changes.

All authors agree upon certain essentials for a successful solution. These are (1) perfectly clean hard glassware. (2) Water freshly double or more preferably triple distilled in a glass still having no rubber connections. (3) Chemically pure re-agents, preferably Merck's, dissolved in the water mentioned above. Our most satisfactory results have been obtained by rinsing all glass utensils with equal parts of concentrated HCl and HNO_3 taking care that no small area on the inner surface escapes the process. They are then placed under running tap water until all the acid is removed. This is then followed by a rapid rinsing first with ordinary distilled water and then with distilled spring water. If this procedure be carried out on new glassware, it need not be repeated as long as utensils are reserved for this use only, as simply rinsing them in distilled spring water cleanses them sufficiently for use. During the past few months, Jena glass has not been obtainable but American made glass has served just as well.

For the preparation of the reagent, 2000 cc flasks either the Erlenmeyer or round bottom, are found to be more satisfactory and more easily handled than beakers. In our experience, the distilling of the water is the most important factor determining success or failure in making the solution. Any of the re-agents, if dissolved in improperly distilled water, will spoil any solution for which they are used, even if the bulk of the water be satisfactory. Frequent distillations of our tap water fail to give water which would produce a proper solution probably because of the chlorites added for the purpose of purification, which allow volatile chlorine to come over into each freshly distilled solution. On the other hand, single distillation of spring water sold for drinking purposes gave perfect results. All of the difficulties of preparation (usually resulting in the so-called protected solutions) in our laboratory have been directly traceable to the water.

All solutions of our re-agents were kept in stock and were made from Merck products and distilled spring water. The only method ever employed here is that of Miller, Brush, Hammers and Felton. 1000 cc of distilled spring water was heated slowly in a 2000 cc flask to 50° C., then rapidly to 60° C. when 10 cc of a 1% solution of gold chloride and 7 cc of a 2 % solution of K_2CO_3 were added. At 80° C. 10 drops of a 1% solution of oxalic acid were added; at 90° C. the flask was removed from the flame and slowly drop by drop 5 cc of a 1% solution of formalin was put in. The flask was then shaken until there appeared a pink color, slowly changing to a violet and then to a deep dark red, clear to both direct and transmitted light, and occasionally with a light golden shimmer. In addition to having the proper color, this solution when set up in the ordinary manner, must also remain unchanged when run with a known normal spinal fluid; give a typical curve with a known paretic fluid; 5 cc of it must be completely precipitated in one hour by 1.7 cc of a 1% NaCl; and, most important of all, must be neutral to a 1% solution of Alizarin red in 5% alcohol. The technique for testing the neutrality of the solution is very simple. To 5 cc of the solution in a test tube is added 2 to 3 drops of Alizarin red as indicator. The color appears canary yellow in the acid, brownish red in the neutral, deep dark red in the faintly alkaline to a deep purple in the strongly alkaline solution.

Only the neutral solutions should be employed. If found either acid or alkaline, it can be corrected by adding small amounts of N/50 NaOH or HCl. After a satisfactory solution is once obtained, it appears to be very stable and if kept corked in a dark cupboard will remain satisfactory for months. The fine black precipitate or even the surface mould which occasionally appears in warm weather will not interfere with the reaction.

A so-called protected solution reacting neither to 1% NaCl nor to a known positive fluid is usually alkaline. Felton considers that such a solution is due to an unusually wide distribution of the colloidal articles from slow or irregular heating. We have found correct the observation of Craig that alkaline solutions are inert with a positive spinal fluid; slightly acid solutions will react as usual with paretic fluids but will also give with normal fluids a curve similar to that of syphilis, while a strongly acid solution will give very little reaction with a positive solution, but will show an abnormal reaction with normal fluids. Therefore, we agree with the majority of authors that a neutral solution is of the most vital importance.

The technique of setting up the test is very simple. Eleven clean test tubes are set up in a rack and to each is added 1 cc of a .4⅜ NaCl. In the first tube in addition is placed .8 cc of the salt and .2 cc of spinal fluid, making 2 cc of a 1 to 10 dilution. From this tube 1 cc is removed and added to the 1 cc of salt in the second tube, making a solution of 1 to 20. This is continued to the tenth tube, which has dilution of 1 to 5120 and the last 1 cc of this dilution is discarded. Then to each tube is added 5 cc of the colloidal gold solution and the tube well shaken to facilitate mixture. The 11th tube therefore contains only NaCl and colloidal gold, and therefore serves as a control.

A positive reaction if present at all begins to appear at once and then intensifies for several hours, being complete at 8 or 12 hours. As Solomon and Welles have mentioned, all syphilitic curves appear the same at first, with a paretic one developing later, and are only complete after 12 hours, so that if read too early, a paretic curve may be confused with a syphilitic one. On the other hand a test showing no beginning color changes at the end of half an hour may as well be discarded as none will appear later. For our readings, we designate an unchanged fluid as 0; a bluish red as 1; a reddish blue as 2; a deep blue as 3; a grey blue as 4; and colorless as 5. Because of the peculiar shades of red, all readings must be done with direct daylight, holding the tubes up against the sky, instead of against green grass or colored buildings.

The so-called typical paretic curves shows the first few tubes completely precipitated, giving a colorless solution, while lesser changes may appear in the remaining ones, as 5, 5, 5, 5, 4, 3, 1, 0, 0, 0. The syphilitic curve shows the first one or two tubes unchanged with a maximum color change which is usually 3, seldom beyond 4, in the 4th or 5th tube, as 00 2 3 3 1 1 0 0 0. This includes the curves of both tabes and cerebrospinal syphilis as this reaction does not differentiate between them. The so-called meningitic curve which does not distinguish between different types of meningitis or myelitis is designated by the early writers as "Verschiebung nach Oben" and consists of a curve showing color change in the right half of the tubes with a maximum reaction in the 7th or 8th as 0 0 0 0 0 1 33 1 0.

We feel that the colloidal gold reaction while requiring a careful technique has been simplified by careful workers until it is easily within the reach of any routine laboratory.*

(Discussion papers of Drs. Warwick and Nixon).

DR. S. MARX WHITE, Minneapolis: Mr. Chairman, Ladies and Gentlemen: I should like to emphasize the importance of the more widespread use of these diagnostic tests than now appears to be the case, because of the fact that a considerable number of individuals with cerebrospinal lues, or advanced lues, have very minor evidence of their disease. Many will have locomotor ataxia with only some areas of anesthesia or fixed pupils which might be missed by a very cursory examination. They may have very slight lightening pain or gastro-intestinal symptoms, and it is a not infrequent thing for the clinician to see cases which on careful study prove to be tabes which have been subjected to abdominal operation, not once but two or three times, and it is a striking evidence of the carelessness—I think no lesser word should be used,—in the study of some of the gastro-intestinal symptoms

*For a more complete treatise of this subject see "Colloidal Gold Reaction and Its Clinical Interpretation," by Warwick and Nixon, in Archives of Internal Medicine, February, 1920.

that we go no further. The tabetic will often show minor symptoms or signs, and such examination should not be omitted from these cases of abdominal pain and conditions which might not seem to be related at all to cerebrospinal lues. It is only by the careful use of this test, and sometimes even then the careful neurological examination is of quite as much value as the cerebrospinal fluid, but these tests ought never to be omitted because of the positive results which are frequently obtained particularly with the colloidal gold and other laboratory tests.

DR. CHARLES E. NIXON, Minneapolis, (closing): Mr. Chairman, Gentlemen: I wish to emphasize, briefly, again, the importance of spinal puncture. In reference to the specificity of these methods, a rather interesting case occurred in our City Hospital recently. A very sick patient was brought in and Dr. Warwick did a spinal puncture and a very positive colloidal gold test was obtained with both luetic and meningitc curves, and with one thousand cells. The man was given salvarsan with very definite improvement, and that was continued and the man recovered so far as any symptoms of meningitis were concerned. The man was very ill and the spinal puncture was the deciding feature that saved his life.

PREVENTION AND CONTROL OF THE VENEREAL DISEASES*

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In the past fifty years the socialization of medicine has paralleled the centralization of commerce and the organization of labor. It is no longer possible for the individual physician to maintain the isolation and the arbitrary powers and responsibilities which were his in primitive times. The advance of both the art and the science has compelled the development of partnerships and group practice, in which the knowledge of one man supplements the lacks of another, to the advantage of the sick for whom and upon whom they work. As this idea of co-operative effort develops within medicine itself, a new form of relationship in the maintenance of human welfare appears upon the horizon. A partnership between intelligent and well informed public opinion and the physician as leader is the logical ultimate expression of the trend of the times. Medicine is beset with problems whose solution is impossible except by the widest cooperation and the broadest understanding imaginable. The physician as a leader acting alone is helpless. It was said of the Roman legion that its tremendous effectiveness as against the phalanx was due to the fact that every man in it was an accomplished warrior who could, if alone, give admirable account of himself. To make every intelligent man, woman and child a legionary in the organization of the public health, some of the knowledge so long sedulously kept as the property of the profession of medicine must be imparted to the rank and file.

One by one the greatest scourges of the race are succumbing to this new strategic method. Malaria and yellow fever are giving way not alone before the advance of medical knowledge, but also before the popularizing of that knowledge which makes every day people intelligent cooperators in the campaign. Tuberculosis mortality is falling, not alone because of new conceptions in its treatment, but because of the tremendous force of public knowledge and sentiment. In time the same fate will await cancer, syphilis and gonorrhoea.

Syphilis and gonorrhoea perhaps more than any other of the great plagues which scourge humanity, need the new strategic method. Medically we are armed to the teeth against them. All the paraphernalia of battle is at hand. Against these two diseases we can move with irresistible force on the dawn of the day of human enlightenment. That dawn is very near. Once we can open the eyes of the every day man and woman to see the enemy as he is, his course is run.

There is no device known to a cruel, unscrupulous and implacable opponent which has not been used against us by these twin scourges. They have crept into our homes and murdered the innocent and the helpless. They have appeared to many a sincere well-wisher of mankind not in their true semblance of brutal, wanton and savage mutilators and destroyers, but in the disguise of well-wishers, guardians of the moral life, painful but just chasteners of iniquity. Many a sincere but uninformed or unthinking man or woman has shuddered to think that these things must be, and yet feared to protest against

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them, refused even to know about them lest with one horror removed or explained away, they should confront a worse one. We have lived the nightmare of one who dreams that his awakening will be his death, and dares not open his eyes.

Syphilis and gonorrhoea are not what public misconception makes them. Quietly and dispassionately examined, they can be easily seen to be no more disreputable than other disease enemies of the race. They have likewise no supernal power or commission. They are no more repellent to the senses than many another ailment. There is nothing in their origin which gives us cause to refuse to know about them. In fact an understanding of them is the more obligatory upon us because they undermine and attack the citadel of life itself. The clothing of mysterious words and allusions, of shame-fast silence, of false disgrace, of painted horror that surrounds them is their cloak of darkness which protects them from the vengeance we would visit on intimate and secret enemies. Like murderers who mingle with the crowd upon the very scene of their crime, syphilis and gonorrhoea stand so near to us that although they have attacked our very germ plasm and our physical immortality, we have not known them for what they are.

The movement for a new conception of these two diseases, which will make the common man a legionary, and will enlist against syphilis and gonorrhoea all the force of an enlightened public sentiment, begins with a choice of words. The armor of the third and fourth great plagues is words. For generations syphilis and gonorrhoea have been called venereal, until the mere use of the term throws a cloak of odium over any subject to which it is attached. People are afraid of it, afraid of being shocked, afraid of being besmirched, of having the loathsome thrust upon them. And all this repulsive connotation, wholly uncalled for as it is, plays into the hand of syphilis and gonorrhoea. Labels that attract lead us to scrutinize the object. Labels that repel, turn away our gaze and foster ignorance. Much of our public attitude toward syphilis and gonorrhoea, our false modesty and mistaken shame, our ultra-sexual point of view, is the product of false labelling. To look at syphilis and gonorrhoea with the verbal veil withdrawn is not to turn to stone before the Medusa gaze, but to be inspired to dash at the monster and demolish it. To withdraw the veil and permit people to face the facts, is the first function of a public health movement against the "disease of vice."

A dispassionate and calm analysis; good Anglo-Saxon words; the simple dignity of truth-telling; iteration and reiteration, will yet awaken a sleeping public thought to the enemy within our gate.

Syphilis and gonorrhoea are neither crimes nor secrets, but are communicable diseases which are a decided menace to the health and efficiency of the people and which our State and National Health authorities are endeavoring to prevent and control. This endeavor is not a so-called "Reform" wave sweeping over the country, but a fight on these diseases in the interest of National health, which will be continued as long and as efficiently as that of any other communicable disease.

A scientific study of the prevention and control of any communicable disease requires a thorough knowledge of the causes, modes of transmission and prevalence of that disease. The cause and modes of transmission of the venereal diseases have been known to the medical profession for hundreds of years, but their extensive prevalence was not realized until through the activities of the profession which were brought about by the recent war conditions, there was discovered a prevalence of these diseases sufficient to seriously affect our military as well as our industrial man power; in fact they have been conclusively demonstrated to be sufficiently prevalent to endanger the future development of the nation.

These facts convinced President Wilson, his cabinet and Congress, that false modesty could no longer shield one of the greatest dangers to America's health; for it was realized then, as now, that ignorance and secrecy were largely responsible for the condition, and that exposure and publicity would bring reform.

For this reason the Government through the State and Federal Health Service has undertaken the task of controlling and preventing, as much as possible, the incidence of these diseases, which have been proven to be the most prevalent as well as the most destructive to our national efficiency, of any of the communicable diseases.

In order to change these conditions and to reduce as much and as rapidly as possible the incidence of these diseases, there has been formed, by Federal authorities and with the approval of the President of the United States, an organization known as the Interdepartmental Social Hygiene Broad, consisting of the Secretary of the Treasury, Secretary of War, Secretary of the Navy, and the Surgeons General of the Army, Navy and the United States Public Health Service. The Surgeons General of the Army and Navy were placed in charge of and were responsible for the venereal disease control activities of their respective military organizations, while the Surgeon General of the Public Health Service, was placed in charge of the civilian activities; however, all of these activities are correlated, and in cooperation are directed to the one end, that of venereal disease prevention and control.

A Bureau of Venereal Diseases has been established by the Surgeon General in the United States Public Health Service, and a commissioned representative of this service is assigned to each state in which the Health Department has reached the required standard and complied with the necessary requirements; this officer in cooperation with the State Health Department is in charge of venereal disease control activities in the state, and is designated as the Director of the Division of Venereal Disease Control of the State Health Department.

The problem of venereal disease control and prevention is the most difficult with which health authorities are called upon to contend, owing to the four following reasons:

First, that the incidence of these diseases is primarily due to the strongest and least controlable, natural instincts and passions in the human mind.

Second, ignorance on the part of the public in regard to these diseases and their disastrous effects.

Third, the prevailing ignorance and false modesty in regard to sex, sex hygiene and concealment of the venereal diseases.

Fourth, the most important of all, is quackery, carelessness and ignorance in the diagnosis and treatment of these diseases.

If all communicable diseases were subjected to this same quackery, carelessness and ignorance of modern methods of diagnosis and treatment their prevalence and mortality would be appalling.

One of the great obstacles to the treatment of gonorrhoea is an ancient lie expressed in the now hackneyed quotation of a current remark "A dose of clap is no worse than a bad cold." This monumental falsehood is at last being nailed by the combined efforts of medical profession and laity, city, state and nation. With such an impression of the disease dinned into his ears by tradition and associates it is little wonder that the young man of the average type finds the restrictions and exactions of adequate treatment irksome. It is little wonder also that he falls an easy prey to all sorts of quackery and to the wiles of Jimmy the drug clerk, who is always "there" with the right thing to take "to dry up a dose" and has no unpleasant ideas about the "water wagon" and avoiding sexual relations while the cure is going on. Of course the boy who "falls for" this stuff wakes up with a jolt some day, and crawls to some doctor's office with a chronic urethrities that may never clear up entirely, and a prostatitis and vesiculitis that have snuffed his chances for all that makes his later life what it ought to be. There are no superlatives adequate to describe the human vermim that thrive on this sort of thing. Among them must be reckoned not alone the advertising quack and the men's specialist, but those commercial concerns which make and market, and those drug stores which permit upon their shelves the innumerable "specifics" for the self-cure of gonorrhoea and "gleet," whose alluring promises appear upon the walls of every bar and toilet room. The "clap doctor" with his waving hair and the fatherly look and voice, is still with us. He is the man who plucks the inexperienced boy of the last cent he can beg, borrow or steal, and then turns him out with the words "That morning drop means nothing; you are cured." Not far removed from his level, to our shame be it said, is that type of physician, fortunately becoming more and more rare, whose conception of the cure of gonorrhoea ends with "drying it up" and whose ignorance of the miscroscope and all the modern tests for cure is only equalled by his scorn of them.

However, the young man who ignorantly sub-

jects himself to this injurious form of quackery is not the most pathetic victim of the faker, for he often marries and infects a pure and healthy young woman, the mildness of whose early symptoms never brings her to medical attention until the outlook for cure is almost nil, and even when definite and troublesome symptoms appear they are usually misinterpreted into the terms so often used by profession and laity, to conceal the facts such as "cold" on the bladder, with frequent urination; "leucorrhea," "abscess" following the first sexual relation after marriage; "appendicitis" when after the first menstruation, the gonococcus sets up an inflammation in the tubes; and "child-bed fever" perhaps if the ascent of the infection is delayed until after the first child is born.

If her infection is acute at the time of parturition, the probability of her being delivered of a case of gonorrhoeal conjunctivitis neonatorum is evident to every physician, and the delivery of the child opens the way to some of the most disastrous complications of the disease. After the passage of the child the womb is literally raw and bleeding, and the way is open through the lowered resistance of the tissues, which is impossible under normal conditions for infection to get a start. The gonococci in the neck of the womb seize the opportunity, in company with other germs, to make a whirlwind charge, and within a few days, or, perhaps a few hours, the mother may be dead of "child-bed fever." However, if she escapes death, she is likely to become a hobbling pain-wracked cripple until a radical operation relieves her of all the damaged structures.

Quackery and inadequacy in the treatment of syphilis carries more than the danger of failure to cure. It makes possible under an outward aspect of calm, the recurrence of infectious lesions, the progress of the disease in the internal structures, under a skin kept clean by halfway measures and permits the transmissions of the disease to others, even to the unborn.

Syphilis is one of the most remarkable diseases which affects the human race. It is a master disease, the peer, and indeed the superior of tuberculosis in the wide range of its influence over the fate of mankind, present and future. There is not a tissue or a structure of the body which syphilis cannot affect, nor it there an aspect of the entire science of medicine in which it will not be encountered. Sir William Osler coined the famous phrase which for all time expresses the relation of syphilis to medicine "Know syphilis in all its manifestations and relations, and all other things clinical will be added unto you." No lane is so long that one may not find syphilis at its turning. The disease has changed the destiny of mankind upon the earth. If it should cease at this moment to be transmitted, its effects would not disappear from the world within two and perhaps three generations. Few indeed of living human beings can boast an ancestry free from its remote effects.

The adequate treatment of syphilis, by whatever means it may be approached, is not a matter of days or weeks, but months and years, necessitating considerable expense and a degree of expertness that is not generally enjoyed. In this simple statement lies four-fifths of the problem of the disease in personal and social life. Just what constitutes adequate treatment can only be determined in the individual case. However, it may be safely said that the three or four injections of arsphenamine and a few mercurial injections or rubs which many patients get is not adequate. One or two negative Wassermann tests are no measure of adequacy, popular though this fallacy is. In fact some of the most recent work on syphilis is tending to show that what even a good deal of treatment accomplishes is simply a reduction of the infection to harmlessness, rather than a cure signalized by the killing off of all germs. In the face of such considerations, it is becoming increasingly difficult to tell the patient just what cure means and what will secure it. It should in general be understood that for all practical purposes, cure means lifelong freedom from all symptoms and signs of the disease, and no risk of transmission to others, hereditarily or directly.

Frequent efforts have been made to control and limit the spread of the venereal infections by segregation and examination of carriers, all of which have been proven of little or no value, but the success of the present plan is assured, the degree of which alone can be questioned.

This plan contemplates three separate programs of activities for the accomplishment of

the following objects; first, the education and enlightenment of the people in regard to the subject; second, the control of carriers; and third, the adequate treatment of the infected.

This plan is characteristic of the American in that it is bold, practical and absolutely modern. The spectacle of the Government's bending its efforts to the solution of the problem of venereal diseases control would astonish our ancestors no less than would the automobile, the flying machine and the wireless telegraph.

But the entire situation is rapidly being modernized, and thanks to splendid cooperation from medical profession, state and city boards of health, broad-minded editors and others, success is now in sight.

The words "syphilis" and "gonorrhoea" are appearing daily in the largest newspapers in the United States and the readers are coming to look upon them as the names of diseases, and not of crimes.

Motion picture plays treat the subject quite frankly without offending audiences. Lectures are being delivered to mixed audiences in public meetings, and the sermon is being preached from the pulpit. Primary sex knowledge is being imparted to High School pupils, and educational pamphlets written especially for each of the different classes of people are being widely distributed, to reach all classes of people.

Regulations of the State Board of Health have been adopted and legislative enactment secured which with proper cooperation will insure control of not alone the female carrier but the infected male from the time medical aid is sought until he is rendered non-infectious or red.

The free clinic has been established in the larger cities for the treatment of the indigent and those under arrest, detention or in penal institutions, and it is presumed that these free clinics will be developed into both free and pay clinics for the most scientific diagnosis and treatment obtainable.

Every day the field of the worker broadens and the opportunity for the plan of the State and Federal Health Service to attain success comes nearer realization.

In the compilation of this paper due credit is given to John H. Stokes, A. B., M. D.

NOTES ON INJURIES TO THE SKULL*

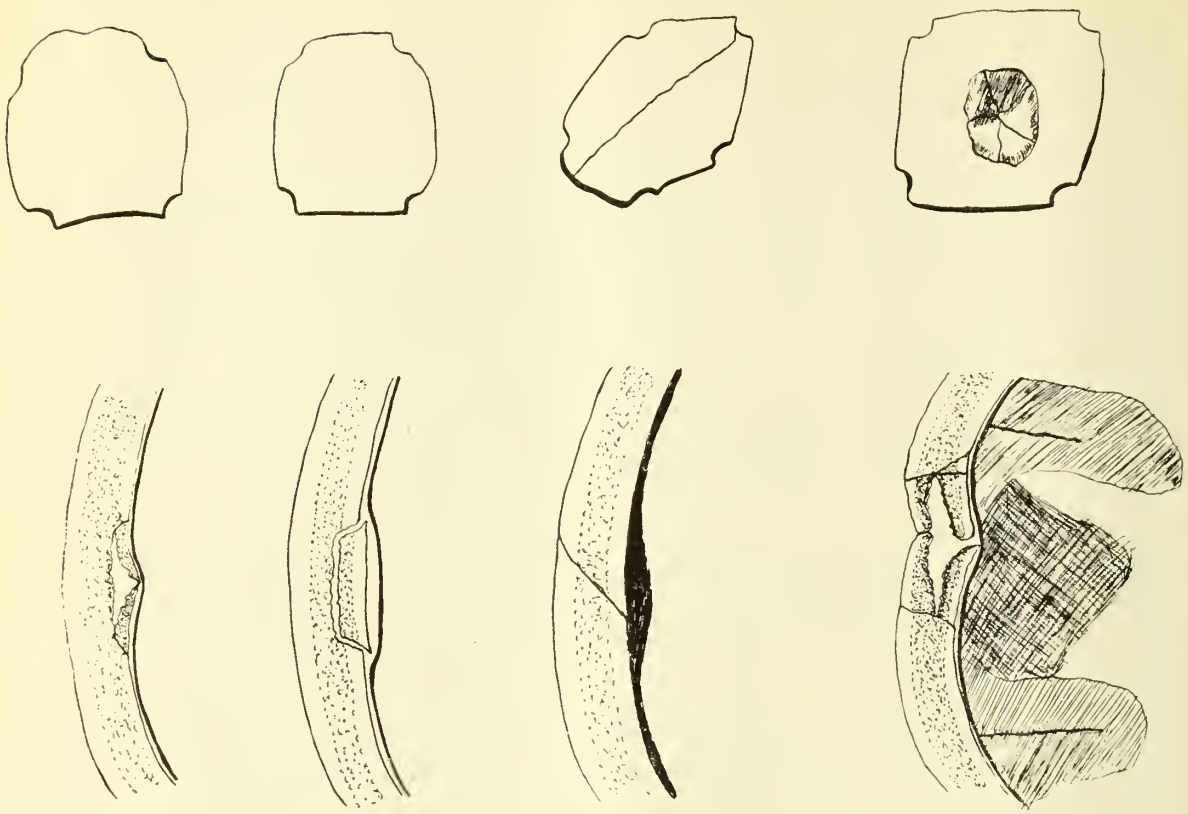
By Orville N. Meland, M. D.
Warren, Minn.

The purpose of this paper is to make a brief report upon injuries to the skull and brain as seen in an overseas hospital. It does not represent a concentrated study of these cases but merely a few general observations, with especial references to treatment, as these cases came in with the other wounded. Bearing these things in mind, certain conclusions may be drawn which may possibly be beneficial in civilian practice when we are called upon to treat this type of injury.

The observations in this paper were made on about 50 cases, which were reported to Colonel Harvey Cushing by Major Martin W. Reddan, whom it was the writer's good fortune to work with in a number of operations. Thirty-five of these were operated on primarily at the hospital and the remainder had been operated on at some further advanced station. A few of these latter were reoperated on because of the presence of foreign bodies which had not been removed. Two cases developed cerebral hernias, one of whom died from rupture of an abscess into the ventricle. One case of basal fracture was brought in, which died from hemorrhage from the cavernous sinus, as shown by autopsy. With the exception of the two fatal cases mentioned above, the remainder were evacuated to the rear. What the mortality rate amongst them was, I do not know, as that is largely dependent upon infection. Some of the patients were permanently affected with paralysis of various degrees, due to injuries in the motor cortex, while one was permanently blind, due to severance of both optic nerves; but a large number showed no signs of any derangement whatsoever.

In looking over the rather extensive literature on injuries to the brain and skull, we find many classifications of these wounds. Cushing (1) (2) in two very good articles which seem to cover the subject thoroughly, divides the type of wounds into groups of varying degrees of severity, but for simplicity's sake, we

*Read at the meeting of the Red River Valley Medical Society, Crookston, Minn., Oct. 8, 1919.



Groups 1 and 2 (Cushing)

may say that there are roughly two classes; those without penetration of the dura and those with penetration of the dura with destruction of brain tissue and lodgment of bone particles and the foreign body in the tract. However, if you will turn to the wall, we will go over the illustrations of Cushing's groups as shown on the charts he has kindly permitted me to use.

(1.) Simple scalp wounds. This type is relatively simple, but unless one has been careful in his examination, one may overlook serious injuries masquerading under this simple diagnosis.

(2.) Local fractures with intact dura with or without cerebral contusion. Here, he finds one type with an external table intact and a fracture of the inner table, or a second type where there is a depression of both tables. In these cases the prognosis is very good, even though one opens the dura during exploration.

(3.) Wounds with local depressed fractures, lacerations of dura and cerebral contusion. Here, the prognosis is good even though the dura is perforated as there usually is no extrusion of brain matter and the destroyed portions are easily removed.

(4). Wounds, usually of the gutter type with detached bone fragments driven into the brain. Here, there is a direct opening from outside in and of course, there is greater chance for infection, with extrusion of devitalized brain tissue.

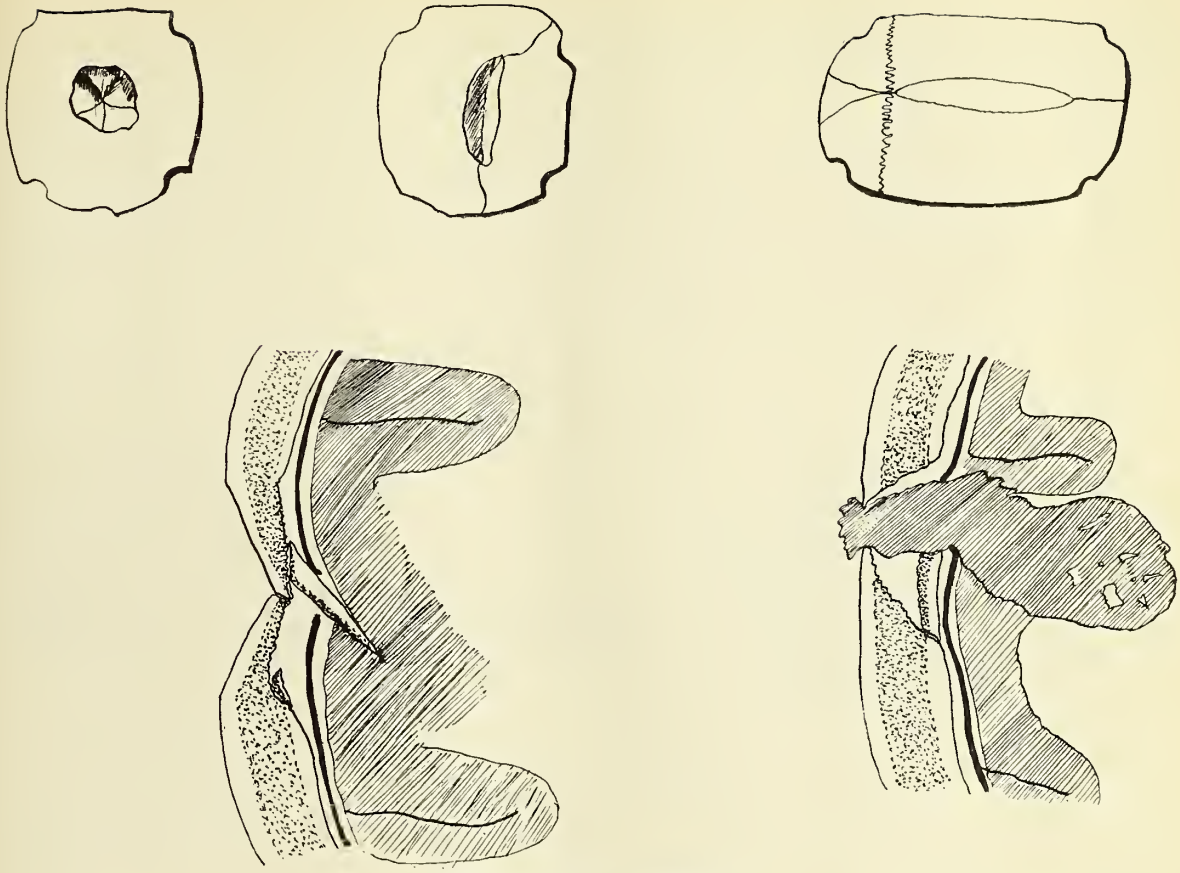
(5.) Penetrating wounds with lodgment both of projectile and bone fragments.

(6.) Ventricle penetrated or traversed by bone fragments or projectiles.

(7.) Wounds of craniocerebral type involving face and ear.

(8.) Through and through wounds involving the cranial chamber.

In these groups from 5 to 8 inclusive, the prognosis is more or less grave because of the amount of devitalized brain tissue and of the presence of bone fragments and projectile in the tract. Infection is very apt to take place and is especially grave where the ventricle has been penetrated or where the missile has passed



Groups 3 and 4 (Cushing)

through one of the nasal or aural sinuses before passing into the brain as the fragments are more apt to carry in infection.

(9.) Bursting fractures with wide spread cerebral contusion. In this group, there is a wide destruction of bone and a widespread contusion of the brain. Infection is not a great element here. The mortality is high, and a proper cerebral decompression is the only treatment.

Of these various grades of wounds, we observed only a very few from 4 to 9, except such as had been operated on previously. These cases were usually grave and were often seen only by the "Head Teams" in advanced stations, as shock and hemorrhage would invariably be the cause of death. Most of the head cases seen were of the first three types, largely due to the use of the steel helmet. Time and again, the greatest force of the projectile was broken by this protection and what would have been a grave head injury became an injury of the simpler type, often of Group 2 or 3.

In the matter of treatment, there seemed to be a divergence of opinion; many contending that the same principles of debridement with the wide open wound should govern here as well as in other portions of the body. Various ways of taking care of these unfortunate boys were tried out, but gradually the method evolved by Cushing seemed to have been accepted and that was the one used by us.

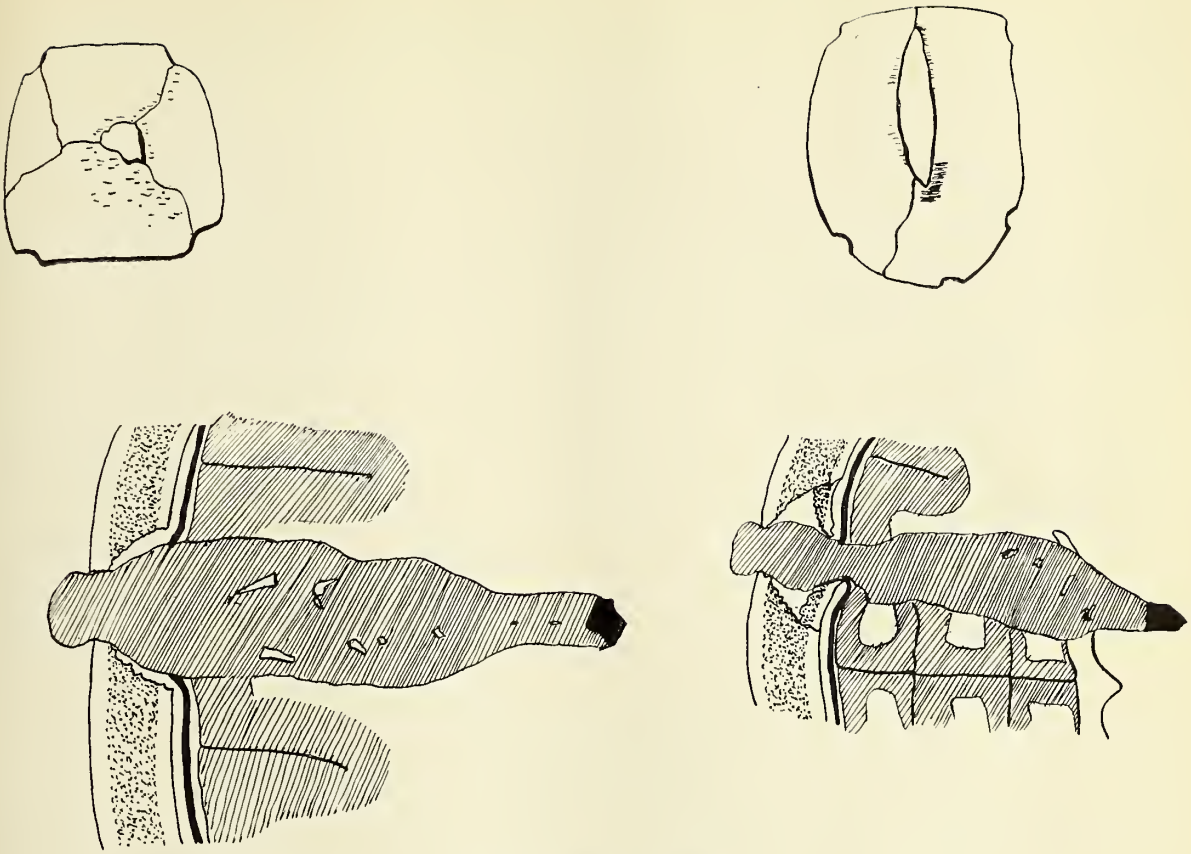
In the first place, there was always a careful examination of all wounds, with an x-ray of the skull in both planes. This gave a clue as to the presence of a foreign body and often an insight as to the presence of a fracture. Cushing laid especial stress on the thorough examination of wounds which were diagnosed "scalp wound," and to this we can heartily agree, for, in a number of cases, patients walked in, in which a depressed fracture was present with no symptom except a slight headache, and upon operation there was found a depressed fracture of the inner table with an extra-dural clot as shown in Group 2.

All cases coming to operation had their heads thoroughly shaved and after painting with tincture of iodine, a tripod incision was made through the wound in such a way that the wound surface were cut away. The pericranial tissues were then lifted up and the perforation or dent in the skull revealed. By means of a trephine and burrs, a small block of bone containing the infected perforated bone was removed "en bloc" and the dura inspected. If there was a clot present, it was removed and if the dura was of good color and had not been perforated, the wound was sponged off with Dakin's solution and after inserting a rubber tissue drain at the lower angle, it was closed tightly with silkworm gut sutures. However, if the dura was discolored and there was no pulsation present, the dura was carefully opened and the subdural clot removed, with cleansing of the brain tissue. Thereafter, the dura was carefully sutured with fine silk and the wound closed as before. There was more or less hesitancy in opening the dura, passing from what was a dirty field into a clean field, but, as Cushing states, with the improvement of technique, there seemed to be less risk in doing this, as compared to the benefit the patient derived by evacuating the subdural clot and removing brain pressure. Where there was a penetrating wound with the lodgment of a projectile or bone particles along the path of destruction, there was an attempt to remove the foreign body and to cleanse the tract, but this cleansing of necessity could not follow the rules as laid down for a classical debridement. Exploration by the finger was not looked upon with favor, although Gray (3) justified it because the tract is already present and it has already been infected by the projectile and the particles carried in with it. The cleansing as done by us was done by Cushing's catheter method. An ordinary rubber catheter was passed into the tract and suction by means of a syringe applied to the other end. This suction pulled up destroyed brain tissue, small bone fragments, old blood and other foreign material and it could be expelled upon a piece of gauze, where the material was examined. If, during the passing of the catheter, a roughing was felt at the bottom of the tract, the catheter was removed and a small forceps inserted, and often one was rewarded by the removal of a foreign body, which most often was a piece of shell casing from high explosive. When all this was done, the wound was closed as mentioned before, with a rubber tissue drain at the lower angle and silkworm gut sutures through all the layers. The drain was removed in 48 hours and the sutures removed according to the condition of the wound.

The anesthetic we used was ether, which we found entirely satisfactory, although most operators preferred a local anesthetic. Local anesthesia was used in a few cases, but as we were forced to use cocaine instead of novocain, which we were unable to obtain, ether was preferred. Local anesthesia undoubtedly has great advantages over the general since you can have the co-operation of the patient if he is conscious and this method would have been used more often by us if we could have obtained novocain.

In regard to the use of antiseptics in the wound, we were also handicapped. Dichloramin T in oil seemed to be the antiseptic of choice, but we were forced to use Dakin's solution. The disadvantage with Dakin's solution, which is an aqueous solution, is that its use leads to an edematous condition of the brain and surrounding tissues and there was more of a tendency to hernia cerebri.

The prognosis varies according to the wound, and is dependent upon a number of factors. Shock and hemorrhage carried off a number of patients before any help could be given them, largely because of the location of the injury and because of the wounding of large blood vessels. Infection was another factor, especially in the penetrating wounds, where the amount of brain tissue destroyed was large or where the ventricles had been penetrated and a meningitis came on secondarily. Many of the patients were saved, but were left with palsies of different sorts, while many who had depressed fractures and no dural penetration were distinctly benefitted by operation. The patient with a palsy due to destruction of the brain tissue itself will have a permanent defect, but the other patient will continue to improve and I cannot help but feel that the operation will prevent a possible traumatic epilepsy due

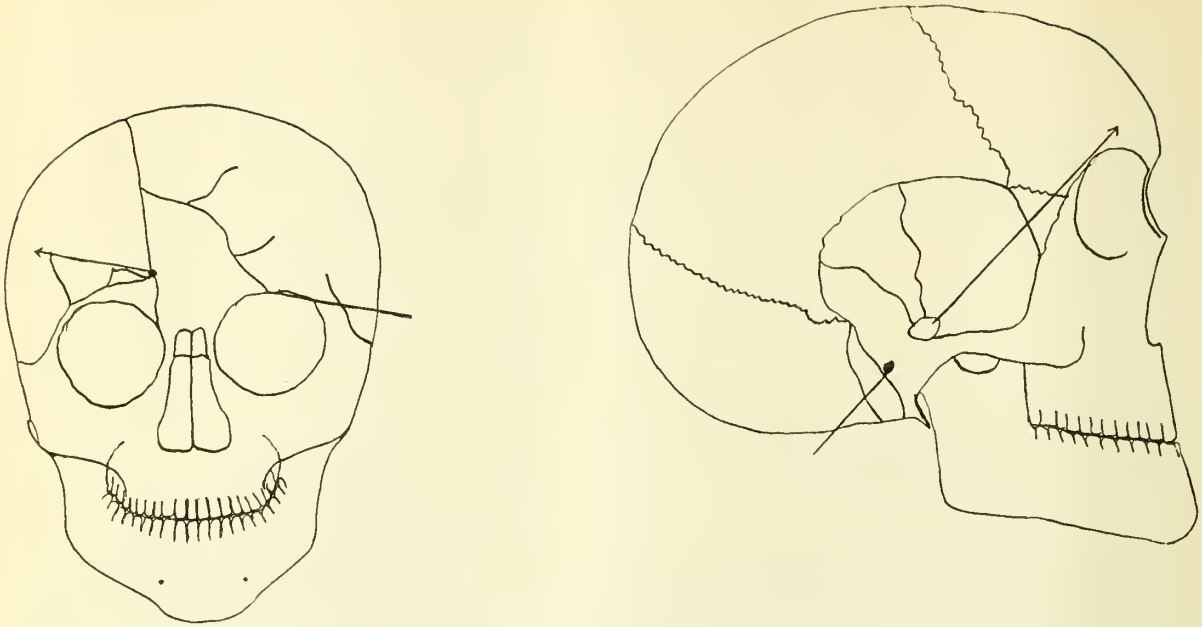


Groups 5 and 6 (Cushing)

to pressure from an organized blood clot with cyst formation.

Our war experience has shown us that wounds of the brain are not necessarily fatal; also, that the brain will tolerate a great deal of damage and infection, with recovery. Of course, in an organ that is really the "telephone switch board" of the body, injuries in this region are often reflected in permanent paralysis if the damage is to the motor area. However, one of the biggest lessons which have been learned is the frequency in which a fracture of the inner table takes place, with an extra dural or intra dural clot, with very little evidence of any grave injury. It is this type of case that we will see in civilian practice and it will be up to us to decide what the course of treatment shall be.

Now, turning our attention to civilian practice, what can be gained from this military experience which may be of use? In looking over the literature, we find that skull and brain injuries are not as infrequent as we would think. Harris & Nissen (4) report 540 fractures of the skull at the Boston City Hospital between 1902 and 1917 which is an average of 36 cases annually for one hospital alone. The same state of affairs takes place in other communities. These cases must be treated, but heretofore, we have often contented ourselves with "watchful waiting" after applying an ice cap. Our experiences have demonstrated that many simple scalp wounds are often complicated by a fracture of the inner table and an extra or intra dural clot. Moreover, it has been shown that even in infected cases, if surgically treated and if given half a chance, nature takes care of these persons in the same way as she does infections in other portions of the body. Furthermore, an injury to the brain is not necessarily more fatal than any other organ provided the injury does not involve the vital centers or does not rupture the large vessels causing an inaccessible hemorrhage. Therefore, it seems reasonable to the writer that, after a careful study, most traumatic skull injuries, not in

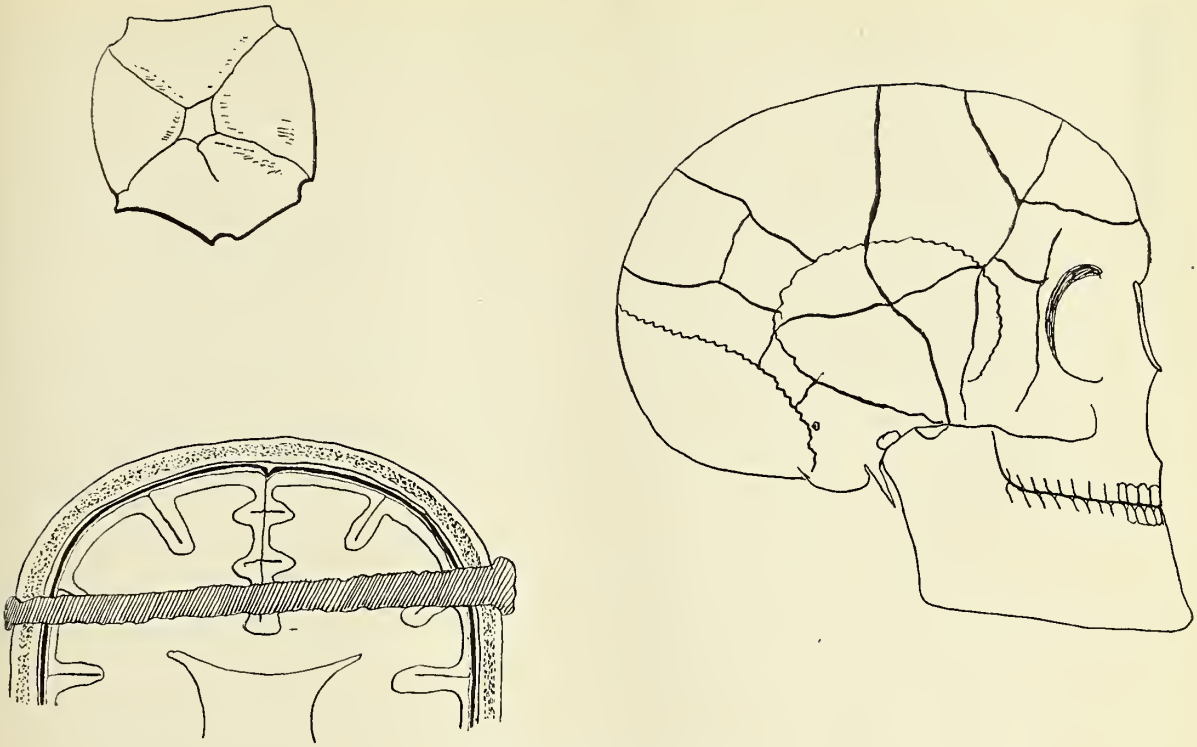


Group 7 (Cushing)

shock, followed by evidence of concussion and pressure should be explored, bone fragments lifted up, clots removed and all sources of hemorrhage controlled. It is true, that the patient may recover from the immediate injury without operation but in later years, he may be a victim of epilepsy due to an unrelieved pressure following his earlier injury. Even in fracture of the base of the skull where the hemorrhage is not accessible and where there is a rising blood pressure, and lumbar puncture reveals a blood tinged fluid under increased pressure, it is advisable to do a subtemporal decompression, since by decreasing intracranial pressure, there is a fall of blood pressure and this in itself may stop any further bleeding.

To illustrate the possibilities along this line, I wish to report two cases.

Case No. 1. E. V., male 27 months old, was brought into the hospital at 11:30 p. m. July 20, 1919. Six hours previously, his parents had found him in the pasture where he had been stepped on by one of the horses. He was unconscious and bleeding from a wound over the right parietal region. When examined, he was unconscious and slightly resistant to anyone touching his head. There was a wound 1.5 cm. long over the parietal region from which, after a short time, a small amount of destroyed brain tissue was extruded. His eyes were closed, pupils dilated and there was a marked weakening of the right arm and leg. Pulse 106, respiration 20. After an x-ray was taken, which was rather doubtful as to the extent of the lesion, we finally decided to operate. A tripod incision was made revealing a compound comminuted fracture of the right parietal and temporal bones similar to the chart as shown in Group 9. There were 4 or 5 depressed portions of the skull which were removed and a linear fracture was disclosed running up over the vertex and down onto the base in the posterior fossa. The dura was torn and destroyed in a number of places and there was marked destruction of brain tissue with profuse bleeding, both capillary and arterial. Bone fragments were removed, the larger vessels ligated and the capillary hemorrhage controlled by small pieces of muscle. The dura was then patched up as well as possible with fine catgut and we then noted that there was a considerable defect which could not be repaired. The opening in the skull measured 3x4 centimeters. After washing out the wound with Dakin's solution, a rubber tissue drain was inserted at the lower angle and the skin and pericranial tissues sutured with silkworm gut and a dry dressing applied. Immediately after operation, the pulse was 180. The next



Groups 8 and 9 (Cushing)

morning it was 176, temperature 104, respiration 56. From then on, the pulse, temperature and respiration dropped until on the third day it was normal. The wound was dressed on the second day and the rubber drain removed. On the 22nd, the baby opened its eyes and the strength in the right arm and leg seemed to have improved. On the 24th, there was a little extrusion of brain tissue but the wound looked healthy. The eyes were open but there was no light perception. Ophthalmoscopically, the right eye showed congestion of the disc, the left eye congestion of the whole retina.

Aug. 5th. Good vision. Moderate cerebral hernia. Wound dressed with Dichloramin T and tight dressings applied to overcome the waterlogged condition of the brain. Patient in good condition, normal in all respects.

Aug. 18th. Cerebral hernia touched with formalin solution.

Aug. 24th. Area touched with formalin. Covered with black eschar, level with rest of skull. Dry dressing. Patient walks with a slight outward swing of the right leg. Sent home.

Sept. 8, 1919. Return for dressing. Skin creeping in at the edges. Eschar in good condition.

Oct. 31, 1919 wound completely healed. Patient showing no sensory or motor disturbance.

Case No. 2 T. T., male, aged 46, by trade a grain buyer. Previous history negative. While working on an elevator, his ladder slipped and he fell, striking his head on a rail. He became unconscious immediately and was brought to the hospital 20 hours later. July 30, 1919. There was complete coma. Pulse 52, temperature 99, respiration 22. Over the left parietal region was an area where he had been bruised. Lumbar puncture was done; the fluid obtained was under pressure and slightly blood tinged. A decompression over the contusion was done by Dr. T. Bratrud and a small amount of bloody fluid removed. Wound closed with silkworm gut and a rubber tissue drain inserted at the lower angle.

Aug. 2nd. Drain was removed. Patient conscious.

Aug. 3rd. Patient unconscious. Cheyne-Stokes breathing. Paralysis right side of face, able to talk. No headache, sees well, moves all his limbs. Pupillary reflexes equal on both

sides. Face pulled slightly over to the left side. Abdominal reflexes present but sluggish. Biceps jerks more marked on right than left. Knee jerks equal. No Babinski or ankle clonus.

Aug. 8th. Restless. Wound dressed. Good condition. Decompression working as evidenced by a pulsation over decompressed area.

Aug. 17th. Rational.

Aug. 21st. Wound healed. Sent home.

These two cases are merely examples of the run of cases which we, as general practitioners, will see and merely show what can be done for these patients when we are called upon to do anything for them.

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EDITORIAL

MINNEAPOLIS CLINIC WEEK

We have no hesitancy in assuring the medical profession of the state that Minneapolis Clinic Week this year will surpass its previous record. This convention meeting for the third time this year will have become a habit and a good one at that. It is a rapidly growing institution.

Coming as it does this year during the week preceding the annual meeting of the American Medical Association in New Orleans, many physicians will be able to take in the Minneapolis meeting, en route. Thus a rather unusual opportunity is afforded those who will, to visit Minneapolis and see what the members of the Hennepin County Medical Society are doing in a medical way. The location of our State University in Minneapolis and the unusual hospital facilities of the largest city in the state offer an unusual stimulus for high grade medical work.

THE VENEREAL CAMPAIGN

The passage by Congress of the Chamberlain-Kahn bill created a Division of Venereal Diseases in the United States Public Health Service. This branch of the service has instituted a nation-wide attack on the venereal situation and its campaign has been conducted among physicians, dentists, druggists, nurses, medical and allied colleges, professional journals and advertising media thruout the country.

During the last fiscal year which ended June 30, 1919 communications were sent out to 132,000 doctors thruout the country. Each was asked to return a card agreeing; first, to report venereal diseases in accordance with the law; second, to do his part in seeing that venereal patients not treated by himself were referred to a capable physician or clinic; third, not to dispense venereal remedies himself, unless they could not be obtained by a drug store and not to prescribe any proprietary remedy marketed for self-treatment and fourth, to give every venereal patient a circular of instruction to be furnished by the Public Health Service or the State Board of Health. Favorable replies were received from about fifty per cent of those addressed. Why a greater percentage did not agree to do their part in this campaign is difficult to understand unless the other fifty per cent do not treat venereal patients. To each physician returning a card, a revised Manual of Treatment of Venereal Diseases was sent. A copy of this Manual may now be obtained by any physician so desiring.

In order to better equip the medical profession in general to treat venereal conditions a plan was suggested to improve undergraduate and graduate instruction in medical and allied schools thruout the country. This is an important recommendation. Most physicians are not interested in venereal diseases sufficiently to become posted on the pathology and treatment of these conditions and have no moral right to half-treat such patients. Reputable physicians are daily writing prescriptions for medication without making the necessary examinations.

In an effort to eliminate the sale of nostrums for self medication directly to the public, letters were sent to about 50,000 druggists throughout the country. They were asked not to prescribe or recommend remedies for these diseases; not to buy any proprietary remedy to be sold to the public for self treatment and to distribute literature furnished by the Surgeon General to persons asking for such remedies. Over fifty per cent of the druggists responded favorably.

Quack doctors and medical institutions were

attacked by requesting some twenty thousand newspapers and magazines to refuse advertising to such individuals and to those nostrums intended for self administration. Only 140 of this number refused cooperation.

The campaign is being continued among dentists in order to better instruct dentists and dental students in the recognition of syphilitic mouth conditions. The tendency for dentists to refer directly to laboratories and even go so far as to associate themselves with general laboratory men, it is to be hoped, will not be encouraged by this campaign. The training of a dentist does not enable him to diagnose general diseased conditions not interpret laboratory findings.

In Minnesota activities have been carried on thru the Venereal Division of the State Board of Health. State regulations effective July 31, 1918, gave the state the right to treat individuals suffering from communicable diseases, including all manner of venereal diseases. This same law prohibited the sale of venereal remedies except on a physicians prescription.

Ammended regulations adopted April 29, 1919 required that each physician making a diagnosis of syphilis, gonorrhea or chancroid report the same immediately to the State Board of Health on a form supplied for that purpose. The name and address need not be reported, as each form is numbered. There can be no reasonable objection to this procedure which furnishes necessary data.

When a venereal patient changes physicians the second physician must notify the first one on card "B", also supplied by the State Board of Health, that he is treating the patient. If an uncured patient stops his treatment and no card B is received from another physician within the prescribed fourteen days following the last visit, card "C" giving the name and address of such patient must be sent in to the State Board. This enables the State authorities to investigate. Any individual known to be spreading a venereal disease must also be reported.

Local health authorities are required to follow up venereal cases and have power to quarantine, cure or written promise to continue treatment with a named physician being required for release.

One of the regulations in force prohibits the issuing of certificates of freedom from venereal diseases which can be used for solicitation purposes. As a matter of fact any certificate of this character can be used for solicitation. Some states, Wisconsin for instance, require such a certificate before a marriage license is granted. The essence of the law is simply that physicians must not issue certificates of this kind indiscriminately.

The entire venereal situation is a delicate one. The law authorizes the state to treat venereal disease. If those who can afford to pay are treated by the several clinics already established in the state, the venereal specialists will find a falling off in their practice. If such individual is refused treatment, he may not have his condition treated privately. What happens? He is reported to the State Board who order him to take treatment at the venereal clinic.

With the state establishing venereal clinics where treatment as well as diagnosis is free and with the various municipalities establishing diagnostic tuberculosis clinics it is not difficult to see which way the wind blows.

METER—LITER—GRAM.

To the credit of the World War will have to be included a definite impetus towards world standardization of weights and measures. The disadvantages of separate national systems was made tragically apparent when France, England and the United States became allies in the recent vital conflict.

It is a most remarkable fact that Great Britain and the United States are the only countries in the entire world that have ultra-conservatively adhered to their awkward, non-standardized systems. We perhaps have not been quite so pig-headed as our British cousins as our currency at least, is established on the decimal system.

It has gradually been dawning in certain British and American minds of late, that if Great Britain and America are to build up world-wide trade in the lively competition which is bound to occur in this period of reconstruction, the throwing over of what have proved to be provincial systems of weights and measures is essential.

Opposition to the change is made on the ground of the great loss of equipment involved. It has been shown that this loss is reduced to a minimum if the equipment now in use be continued during its lifetime but be replaced by newly standardized equipment only.

The advantages from an institution of the meter—liter—gram system of weights and measures because of its simplicity and world wide acceptance (some two hundred and twelve countries now using it) indicate that the present agitation for proper legislation will be successful.

It is not commonly known that the Englishman James Watt thought out the metric system and that our weights and measures and the British system of coinage were handed down from the German Hanseatic League. We first recognized the system when our coinage was put on its present basis. In 1866 Congress legalized the metric system but failed to make it the exclusive system. Germany scrapt the old system in 1871.

The medical profession, though tardily, did see the advantages of the metric system. During the transition period, in which period we may be said to be at present, it became necessary to know both systems. This condition of affairs causes some wierd mental gymnastics with some of us in the realm of prescription writing.

YALE FRESHMEN

The army intelligence test was given in the Fall of 1919 to four hundred Yale College Freshmen. The test is supposed to be one of intelligence and little influenced by schooling.

The following is a table showing the results compared with army figures:

Rating	Drafted Men	Freshmen	Officers
A	7.7%	85.5%	48.4%
B	12.7%	13.7%	34.6%
C plus	20.4%	0.7%	13.8%
C	29.4%	0	2.9%
C minus	19.8%	0	0.3%
D	6.8%	0	0
E	3.2%	0	0

Some 17 per cent of the Freshmen who made an A rating were warned about the quality of their college work a few months after matriculation; some 49 per cent of those with a B rating and 100 per cent of those with a C rating.

The tests were conducted by the psychology department to test the tests rather than the students. If a carefully worked out psychological test could be prepared which would show for instance that a college candidate with a certain test rating had according to experience, only one chance in ten of finishing his Freshman year, the test might become of very practical value.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNEAPOLIS CLINIC WEEK

Minneapolis Clinic Week will be held Tuesday, Wednesday, Thursday and Friday, April 20 to 23, 1920. Clinic will be given each day until three o'clock in the afternoon and clinical demonstrations from four to six o'clock at the Radisson Hotel.

The Hennepin County Medical Society will hold their annual banquet on Monday, April 9th. Dr. Charles H. Frazier of Philadelphia will be the speaker at this banquet. All visitors are invited.

Hotel reservations should be made through Dr. G. Elmer Strout, 900 Donaldson Bldg., Minneapolis, Minn.

AMERICAN PROCTOLOGIC SOCIETY

Twentieth Annual Meeting, Atlantic City, N. J., June 7-9, 1919.

Officers elected for the ensuing year:

President, Collier F. Martin, M. D., Philadelphia, Pa.

Vice-President, J. Coles Brick, M. D., Philadelphia, Pa.

Secretary-Treasurer, Ralph K. Jackson, M. D., Fall River, Mass.

Executive Council—

Jerome M. Lynch, M. D., New York City.

Collier F. Martin, M. D., Philadelphia, Pa.

Dwight H. Murray, M. D., Syracuse, N. Y.

Ralph K. Jackson, M. D., Fall River, Mass.

The next meeting will be held at Memphis, Tenn., April 22 and 23, 1920.

MINNESOTA ACADEMY OF MEDICINE

The January meeting of the Academy was held in these rooms on Wednesday evening, the 14th. Dr. Sweetser presided. After hearing the minutes of the previous meeting, which were approved and placed on file, the question was put whether new members should be elected at this time. It was decided that such election should be postponed for another month. The rest of the evening was taken up with reports of cases and presentation of specimens. Forty members and two visitors were in attendance.

ANKYLOSIS OF LOWER JAW WITH CORRECTIVE TREATMENT

The first report to be made was that of Dr. Ritchie. Several cases of ankylosis of the mandible with corrective treatment were shown by means of lantern slides. Also in the same way, Dr. Wilcox illustrated a method of treating fractures of the tibia and fibula by extension. Both subjects, Dr. Ritchie's and Dr. Wilcox's, were fully discussed by Drs. Geist, Law, Colvin, Benjamin, and Farr.

COLLOID CARCINOMA FOLLOWING GASTROENTEROSTOMY

Dr. Benjamin reported the case of a man 56 years of age on whom he did a gastroenterostomy two years before, removing an obstuctive mass from the pylorus. For a time following the operation the patient improved, gaining in weight and enjoying a better appetite. A month ago a tumor was demonstrable over the site of the original trouble. The abdomen was again opened and a colloid carcinoma as large as a man's fist removed. (Specimen shown.)

UMBILICAL HERNIA; STONES IN GALL-BLADDER

Another case reported by Dr. Benjamin was that of a woman 69 years of age with umbilical hernia and gall stones. Upon operation, the protruding tumor proved to be a mass of omentum. An eliptical incision, which later was closed by imbrication, was made use of. Through another incision (modified Bevan), the gall-bladder was opened and a dozen or more stones removed, several of which were a cubic inch in size, and many were as large as marbles. (Specimens shown.)

Dr. Little showed skiagraphs of gall stones and bladder stones, with full description of the cases. He also reported a peculiar condition found in connection with a case of appendicitis.

SARCOMA OF LOWER JAW

The following case was reported by Dr. Law. Three months ago a girl seventeen years old noticed a swelling in the right lower maxilla. The growth enlarged rapidly, until its removal a few days ago, when it had reached the size of a small orange. The tumor was uniformly hard and surrounded the jaw, lying between the symphysis and angle. To say what it was, without first making a section, was found difficult. It might be a benign odontoma, suggested by its extreme hardness; it might be an epulus, one of the growths of low malignacy, and one which rarely metastasises; it might be a dentigerous cyst; or it might be one of the sarcomata. Radiography threw very little light on the subject; it showed only loss of bone substance. As surgical interference depended on a definite diagnosis, a preliminary section was made. The tumor was found to be a sarcoma of the small, round and spindle-cell type. (Specimen shown.)

INTESTINAL OBSTRUCTION WITH EMPYEMA OF GALL-BLADDER

A second case reported by Dr. Law was that of a woman 58 years of age on whom a diagnosis of intestinal obstruction had been made. For days she had vomited. There was complete obstipation for four days. Abdomen flaccid, epigastrium tense. A mass could be felt projecting from the edge of the liver which proved to be an empyema of the gall-bladder. There was also complete obstruction of the duodenum from adhesions, and from a portion of the great omentum which lay over the bowel and was adherent to the cystic duct. These were released and the gall-bladder was removed. Death followed in 36 hours, and was probably due to the toxemia incident to obstruction.

STONES IN KIDNEY AND BLADDER

The following three cases were reported by Dr. Abbott:

Case I—Skiagraph showing a urethral catheter pointing to a stone in the right kidney. The case was presented because the violent colics of which the patient complained occurred exclusively on the left side and in no case on the right side where the stone was located.

Case II—Skiagraphs showing a large stone in the bladder with a changed position of the stone corresponding with a changed position of the patient. The case was shown because a stone was not observed by the cystoscope. Cystoscopy was done, however, before the x-ray picture was taken. The stone probably could have been found had this part of the examination been made afterward, after it was known positively that a stone was in the bladder. It shows the importance of thoroughness in the use of the cystoscope.

Case III—Skiagraph of a man who had stones in the bladder for two years. The stones were only accidentally found on making a general examination of his urinary tract. The urine was normal, without blood, pus, or albumin; and he had never had any pain in the bladder, nor disuria. Once in a while, if the flow was delayed he would give himself a few shakes—"shimmy" as Dr. Abbott put it—and the urine flowed freely.

STONE IN BLADDER, COMPLICATED BY ANOTHER IN THE PROSTATIC URETHRA

Dr. Owre brought attention to the following case. A man 38 years of age was admitted to the City Hospital with retention of urine that was thought to be due to urethral stricture. He had had dribbling of urine for several years, with attacks of acute retention. A silk-webb catheter met with obstruction in the prostate urethra, and some foreign body could be felt with it. If the catheter was held firmly against the obstructing body, the patient was enabled to empty the bladder. Rectal palpation disclosed a large stone, about the size of a pecan, in the prostatic urethra, which could be moved, but it was not possi-

ble to push it back into the bladder. Still another stone could be palpated in the bladder. This one was as large as a goose egg, and, no doubt, kept the other from being pushed up. The two could be clicked together. The presence of a stone in the uretha made litholapaxy of the larger one in the bladder impossible. (Plates shown.)

LESION OF SPINAL CORD

Dr. Mann exhibited a tumor as large as a man's thumb and gave with it the following history: A man of 50, anemic and cadaverous; unable to attend to business; giving a negative family and personal history, came complaining of pain in his left hip, left lower lumbar region, and left leg. Many physicians had examined him, but none offered any relief. He continued to grow thinner and more cadaverous as the years went by. One physician thought possibly the man had a sacroiliac joint disease, and fitted him with a Goldthwait belt. This only made his pain worse. In 1917 he consulted a neurologist who diagnosed neuritis. A little later his case was studied very carefully by two well-known orthopedists who agreed that probably it was a neuritis—sciatica—but who abandoned the idea a few days later, admitting themselves puzzled. Next, he was seen by another neurologist who offered no opinion at all, but who advised the rest cure. How willingly the patient took to this treatment may be imagined, since he was having so much pain at the time that he was not able to lie down, and for a period of one year had not once been in bed. During the year 1918 he went from one physician to another, as he had been doing the year before. He had his spinal fluid examined, also his blood, but always with negative findings. Under the impression that it might be a neuritis, search was made for a focal infection. His teeth were extracted and his tonsils removed. X-rays of the spine, of the colon, of the gall-bladder, of the ureters and kidneys, and of the bladder were made, all to no purpose, except that nothing was revealed thereby. The pain during this time (always on the left side and in the same place), was so bad that the patient was not able to lie down and sleep. Only when sitting or standing was he able to find relief. Sedatives, other than morphine, had no effect, and for a period of six months he took from half a grain to one grain of the drug daily. When told that he had developed a drug habit, he declared he would break it; and he did, stopping its use altogether after eight days. Still others saw him before he came to Dr. Mann, one of the last physicians venturing the opinion that some local condition in the spine was the cause of all his pain. At any rate, x-ray plates showed a slight enlargement of the twelfth dorsal spine with a thinning of the corresponding vertebral body. Dr. Mann suggested that the spinal cord be laid bare, and, if nothing definite revealed itself then, the dorsal nerve roots be cut. The operation was performed the following morning. The laminae were removed from the upper three lumbar and the lower three dorsal vertebrae. The dura seemed normal. It was opened. The cord felt harder and fuller than normal. At the level of the twelfth dorsal vertebral body there was gradually exposed in the pia a tumor larger than the lumbar enlargement of the cord. It extended from near the top of the twelfth dorsal to the first lumbar body, 1⅝ in. by ⅝ in. by ¾ in., actual measurement. It lay at the back of the cord with some of the dorsal nerve root bundles running over it and about it. Besides the peculiarity of the twelfth dorsal vertebra, there was also an anomaly of the cord. It was shorter than normal and ended near the middle of the twelfth body instead of at the bottom of the second or the top of the third lumbar, so that the upper portion of the tumor lay on the back of the conus at the lower part of the lumbar enlargement of the cord, and the lower portion lay in the cauda equina. The tumor shelled out with comparative ease on gentle, blunt dissection, with three small, dorsal nerve bundles cut and left still attached loosely to the spinal cord. Microscopic examination should determine the definite relations of the tumor to the nerve bundles and to the cord. Evidently it had developed in the pia. The tumor is cylindrical in form, of grayish mucoid color, and spotted with yellow flakes which vary in size from a pin head to a pea. The color has changed somewhat since being treated with formalin, so that it is more yellow. A careful microscopic study of the tumor will be made. The patient felt improved the same day of operation, and shows further improvement after seven days.

At this meeting two names were proposed for membership, i. e., Dr. Angus W. Morrison, Minneapolis, endorsed by Drs. Cross, Roberts and Abbott; and Dr. Harry B. Zimmerman, St. Paul, recommended by Drs. Daugherty, Rogers, and Leavitt.

F. E. Leavitt,
Secretary.

ASSOCIATIONS OF MILITARY SURGEONS OF THE UNITED STATES

The twenty-eighth annual meeting of The Association of Military Surgeons of the United States will be held at New Orleans, La., April 22nd to 24th, with headquarters at the Hotel Grunewald.

Three sessions daily will be held and at these addresses will be made on pertinent topics by members of the association and discussed at the meetings. In spite of the name of the association, the topics dealt with do not confine themselves absolutely to the field of military surgery. That this is so is easily understood as the fact of a man's being in the service does not divorce him from the ordinary problems of the practice of medicine. This meeting occurs immediately prior to that of the American Medical Association whose meeting begins on the 26th and it is hoped that many of those who expect to attend the latter meeting may arrange their plans so as to take in our meeting as well.

It is desired to invite attention to the fact which is not generally understood by medical men of the coun-

try that practitioners in medicine are welcome at any of the sessions of the association even though they be not members themselves. It is the desire of the association to have the medical profession of the country conversant with the work which is being done by The Association of Military Surgeons and we feel that in this way they may very readily become acquainted with it.

Any further information relative to this meeting may be obtained by addressing The Secretary, Army Medical Museum, Washington, D. C.

OF GENERAL INTEREST

Dr. Merton Field of St. Peter has moved to Northfield.

Dr. A. C. Lindberg of North Branch has moved to New York.

Dr. L. J. Gaffney was appointed county physician for the sixth district.

Dr. H. H. Holm of the City Hospital of Minneapolis has located at Glencoe.

Dr. E. W. Johnson was reappointed as county physician for Beltrami County.

Dr. L. L. Elliott recently discharged from the service has located at Warroad.

Dr. Russell M. Wilcox of Minneapolis has gone to Florida for several weeks stay.

Dr. J. A. Sanford of Northfield was appointed county physician for the fifth district.

Dr. Thomas Lowe, Jr. of the Northwestern Hospital in Minneapolis has located at Pipestone.

Dr. Warner Workman of Tracy was made Lieutenant-colonel in the medical reserve corps.

Dr. E. H. Marcum of Bemidji has been commissioned a major in the medical reserve corps.

Dr. Ott has joined the Mayo Clinic and will assist Dr. Adson in the Section of Neurologic Surgery.

Dr. A. A. Meyer of Osakis has located at Sauk Center and will be associated with Dr. P. A. Hilbert.

Dr. Charles Robilliard of Faribault has returned from Boston where he took a special medical course.

Dr. G. L. Jacquet of Ivanhoe has gone to Boston to take special work in diseases of the eye, ear, nose and throat.

Dr. William A. Lee of Underwood has moved to Fergus Falls and will be associated with Drs. Baker and Burnap.

The surgical department, college of medicine, University of Minnesota, was bequeathed $40,000 by the will of Howard W. Baker.

Dr. C. J. Robertson of Grove City will be located at Great Lakes where he will be in the military medical service with rank of lieutenant.

Dr. C. L. Martin has resigned his fellowship in the Mayo Foundation to take charge of the surgical work in a general hospital at Wayne, Neb.

Dr. L. M. Keene of Alexandria has located at Waverly. Dr. Keene was recently commissioned a Captain in the medical reserve corps.

Dr. J. C. McRae has been granted a year's leave of absence from the Mayo Foundation to accept a commission with the American Red Cross.

Dr. Otteraaen, from the Institute of Infectious Diseases, Chicago, has entered the Mayo Clinic for special graduate work in medical photography and clinical pathology.

Dr. R. Dominguez of Cauca, Columbia, who is a graduate of the University of Bogota, is now at the Mayo Clinic for a few month's special work in clinical pathology.

Dr. Hugh S. Cumming of Hampton, Va., was nominated Surgeon General of the Public Health Service. He succeeds Dr. Rupert Blue whose term expired on January 15th.

Dr. Carl D. Kolset of Benson has recently received the appointment of acting assistant surgeon and medical examiner for Swift county by the U. S. Public Health Service.

Dr. William J. Mayo of Rochester has returned from South America. Dr. Mayo visited the national colleges in Peru, Chili and Uruguay to determine the eligibility of South American surgeons for admittance to the American College of Surgeons.

Dr. A. L. Lockwood is now first assistant in thoracic surgery with Dr. Hedblom at the Mayo Clinic. After two years of private practice Dr. Lockwood went abroad for graduate study in Heidelberg and Berlin where he was at the outbreak of the war. He joined the British forces and during his service in the R. A. M. C. received his majority.

Dr. Hundling, a fellow on the Mayo Foundation, has received a Medal of Appreciation from the Royal Government of Jugo-Slavia. The parchment which accompanied the medal is signed by the Minister of the Interior and the chief of the Army Medical Corps. Dr. Hundling served with the American Red Cross in Serbia after his service in the U. S. Army Medical Corps.

The Weum Hospital at South Haven, Minnesota, has recently been reopened under the name of 'The Community Hospital' with Dr. C. L. Roholt as resident physician. Dr. T. W. Weum of Minneapolis will remain on the staff as consulting surgeon. The Hospital has been closed since Dr. Weum moved to Minneapolis in 1918 to limit his practice to Obstetrics, Gynecology and Abdominal Surgery.

Dr. Clifford E. Ekelund of St. Paul is located in the district about Kowel, Poland. He has been having some experience in the fight against cholera and is reported as having had some difficulty overcoming prejudice against vaccination. Forced vaccination by Russian authorities during the war and serious results due to improper sterilization had naturally antagonized the local population.

February 14, 1920 was the fiftieth anniversary of

the organization of the Ramsey County Medical Society in St. Paul. Eleven doctors were present at the first meeting for organization and the following officers were elected: Dr. D. W. Hand, president; Dr. A. Wharton, vice-president; Dr. William Banks, corresponding secretary; Dr. C. H. Boardman, recording secretary; Dr. S. D. Flagg, treasurer.

The younger physicians of Minneapolis have organized a society to be known as the Minneapolis Clinical Club, for the presentation and study of the original work of its members, one of the requirements of admission being the presentation of a thesis by the newly elected members. The following officers were elected: President, Dr. Stanley Maxeiner; Vice-President, Dr. Clifford Boreen and Secretary-Treasurer, Dr. Floyd O. Woodward. Meetings will be held monthly.

A germ known as the bacterium tularense was first isolated by Drs. McCoy and Chapin of the U. S. P. H. S. and identified as the cause of a plague-like disease of rodents. Surgeon Edward Francis has recently found this bacterium to be the cause of "deer-fly fever," a disease occurring among the rural population of Utah. It is known to be due to a fly bite, the site and neighboring lymph glands become tender and inflamed and suppuration commonly follows. A fever resembling that of a septicemia may last three to six weeks. The first fatal case was reported in 1919.

The Carnegie Corporation of New York has announced its purpose to give $5,000,000 for the use of the National Academy of Sciences and the National Research Council. It is understood that a portion of the money will be used to erect in Washington a home of suitable architectural dignity for the two beneficiary organizations. The remainder will be placed in the hands of the Academy, which enjoys a federal charter, to be used as a permanent endowment for the National Research Council. This impressive gift is a fitting supplement to Mr. Carnegie's great contributions to science and industry.

The Council is a democratic organization based upon some forty of the great scientific and engineering societies of the country, which elect delegates to its constituent Divisions. It is not supported or controlled by the government, differing in this respect from other similar organizations established since the beginning of the war in England, Italy, Japan, Canada, and Australia. It intends, if possible to achieve in a democracy and by democratic methods the great scientific results which the Germans achieved by autocratic methods in an autocracy while avoiding the obnoxious features of the autocratic regime.

The Council was organized in 1916 as a measure of national preparedness and its efforts during the war were mostly confined to assisting the government in the solution of pressing war-time problems involving scientific investigation. Reorganized since the war on a peace-time footing, it is now attempting to stimulate and promote scientific research in agriculture, medicine, and industry, and in every field of pure science. The war afforded a convincing demonstration of the dependence of modern nations upon scientific achievement, and nothing is more certain than that the United States will ultimately fall behind in its competition with the other great peoples of the world unless there be persistent and energetic effort expended to foster scientific discovery.

LOCUM TENENS desired from April 10 to July 1, 1920. Applicant is a University of Minnesota graduate, has had internship at the City and County Hospital, and has a State Board Certificate. Address Dr. Arthur H. Pederson, City and County Hospital, St. Paul, Minn.

OBITUARY

DR. PARKER L. BERGE

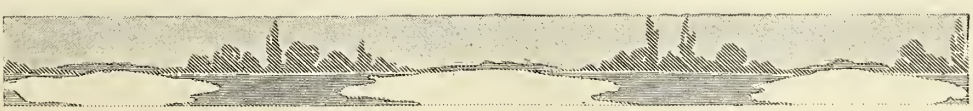
Dr. Parker L. Berge of Brainerd died January 22nd at the age of 32 years, after a long illness due to heart trouble. Dr. Berge was a graduate of Carleton College and the University of Minnesota and for four years was associated with Dr. J. A. Thabes in Brainerd. He was in the war service two years, being a surgeon in the aviation corps. A widow survives him.

DR. H. L. McKINSTRY

Dr. H. L. McKinstry died at the home of his daughter in Granite Falls on Feb. 7th. Dr. McKinstry was born in Mercersburg, Pa., June 4th, 1847 and was a graduate of the University of Pennslyvania. He came to Minnesota in 1875 and established medical offices at Zumbrota, later moving to Red Wing where he practiced for many years. Surviving the deceased are six children.

DR. H. G. HIEBER

Dr. H. G. Hieber of Thief River Falls died at Monrovia, Cal., Jan. 17th. Dr. Hieber was born in Black Hawk, Iowa, on Nov. 10, 1879. After going through the public schools at his birthplace he entered the Northwestern University, Chicago. After graduation he spent some time in post graduate work in Europe, coming to Thief River Falls in 1907. He was married in 1912 to Miss Beatrice Whitten of Anoka. His widow and one daughter survive him.



NEW AND NON-OFFICIAL REMEDIES

During February the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Nonproprietary Articles:

Eucatropine.

Phenacaine.

Gilliland Laboratories:

Gonococcus Vaccine (Polyvalent) (Gilliland).

Staphylococcus Vaccine (Albus and Aureus) (Gilliland).

Werner Drug and Chemical Co.:

Eucatropine-Werner.

Phenacaine-Werner.

Pasteur Anti-Rabic Vaccine (Gilliland).—An antirabic vaccine (see New and Nonofficial Remedies, 1920, p. 272.) prepared according to the method of the U. S. Public Health Service. The treatment consists of twenty-one to twenty-four doses and these are sent separately each day by special delivery. The Gilliland Laboratories, Ambler, Pa.

Pneumococcus Vaccine Immunizing (Gilliland).—A pneumococcus vaccine (see New and Nonofficial remedies, 1920, p. 286.) containing Types I, II and III, respectively, in equal proportions. Marketed in packages of four 1 Cc. syringes and also in packages of four 1 Cc. ampules, containing 250, 500, 1,000 and 2,000 million killed pneumococci per Cc. The Gilliland Laboratories, Ambler, Pa.

Staphylococcus Vaccine (Albus and Aureus) (Gilliland).—A staphylococcus vaccine (see New and Nonofficial Remedies, 1920, p. 288.) containing Staphylococcus albus and Staphylococcus aureus in equal proportions. It is marketed in packages of four syringes containing, respectively, 250, 500, 1,000 and 2,000 million killed bacteria in 1 Cc.; also marketed in packages of four ampules containing, respectively, 250, 500, 1,000 and 2,000 million killed bacteria in 1 Cc. The Gilliland Laboratories, Ambler, Pa. (Jour. A. M. A., Feb. 7, 1920, p. 393).

Chlorovyl.—Cinchophen Hyrochloride.—Phenlycinchoninic Acid Hydrochloride.—The actions, uses and dosage are the same as those of cinchophen (see New and Nonofficial Remedies, 1920, p. 224 under Phenylcinchoninic Acid (Cinchophen) and Phenylcinchoninic Acid Derivatives). Chloroxyl is a yellow crystalline powder with an astringent, slightly bitter taste, insoluble in water. Chloroxyl is also supplied in the form of Chloroxyl Tablets 5 grains. Eli Lilly and Co., Indianapolis, Ind. (Jour. A. M. A., Feb. 14, 1920, p. 461).

PROPAGANDA FOR REFORM

Grale's Fruit Laxative.—This is advertised with the claim: "Grale's Fruit Laxative contains only figs, dates, raisins and prunes, a few simple herbs and bran. NO DRUGS AT ALL." Though claimed to contain no drug, the A. M. A. Chemical Laboratory reports that the preparation was found to contain ground senna. Since senna is a well-known drug of recognized activity, the claim that the preparation contains no drug is false (Jour. A. M. A., Feb. 7, 1920, p. 410).

Dionol.—The Glorified Petrolatum.—The exploitation of Dional is based on the theory: (1) The brain is a generator of neuro-electricity; (2) The nerves are the conductors of this electricity; (3) The nerve sheaths are the insulators; (4) Wherever there is local inflammation, the nerves are short circuited owing to a breaking down of the insulation resistance of the nerve sheaths; (5) This results in "an escape of neuro-electricity"; (6) Dionol coats the nerve sheaths with a nonconducting layer, and this restores the insulation and "stops the leak." Whether this theory was invented to give a "reason for being" for Dionol, or whether Dionol was first invented and it became necessary to evolve a theory that would give some plausibility to the claims made for this etherealized petrolatum, we are unable to say. In any case, the theory and the product are exploited together. The value of the "case reports" sent out for Dionol may be estimated from a report featured under the heading "Infected Wound....." signed "Dr. W." This "Dr." appears to be an osteopath whose specialty, according to his advertisement in his local newspaper, is "Catarrhal Deafness and Hay Fever, Acute and Chronic Diseases" (Jour. A. M. A., Feb. 7, 1920, p. 410).

Hypno-Bromic Compound.—A Vermont physician reports that Hypno-Bromic Compound, manufactured by H. K. Wampole and Co., is sold by druggists without prescription, though it contains in each ounce: cannabis indica, 1 grain; morphine, ¼ grain; potassium bromid, 48 grains; hyoscyamus, 1 grain; chloral hydrate, 96 grains. He writes that he has three young women who have become addicts to the preparation as a result of thoughtless prescriptions from physicians. By visiting the various drug stores in town, these addicts have been able to obtain an ample supply of the preparation. Hypno-Bromic Compound is more than an unscientific mixture; it is a dangerous product that should not be sold indiscriminately over the drug counter. Physicians who prescribe such mixtures and druggists who indiscriminately sell such stuff are disgracing two honorable professions (Jour. A. M. A., Feb. 7, 1920, p. 410).

Eupad and Eusol.—Eupad is a powder composed of equal parts by weight of boric acid and chlorinated lime (containing 25 per cent available chlorin). Eusol is thus made: (a) 25 gm. of eupad are shaken with 1 liter of water, allowed to stand for some hours and filtered. (2) To 1 liter of water add 12.5 gm. chlorinated lime (25 per cent chlorin), shake vigorously, and add 12.5 gm. boric acid in powder and shake again. Allow to stand, decant and filter. If the official chlorinated lime containing 30 per cent available chlorin is used, a proportion-

ately smaller quantity should be sufficient (Jour. A. M. A., Feb. 7, 1920, p. 413).

Influenza Vaccines.—The Medico-Military Review, a semi-monthly mimeographed publication sent to medical officers of the Army by the Surgeon-General's Office, has the following on the use of vaccines against influenza: "YOU ARE REMINDED that so far, a comprehensive analysis of results obtained by the use of monovalent and polyvalent vaccines in the prevention of influenza has not demonstrated their value. Much carefully controlled experimental work is now being carried out on this subject both in civil institutions and in the Army, and any worthwhile advances will be reported in the Review from time to time. If a prospective vaccine is developed, it will be prepared at the Army Medical School for general distribution and all medical officers will be duly notified. The general use of the present commercial polyvalent protective against influenza is not considered desirable. Numerous telegrams and other requisitions are being received for influenza vaccine. In view of the fact that no prophylactic influenza vaccine is available, such requisitions should be discontinued" (Jour. A. M. A., Feb. 14, 1920, p. 466).

Auto-Hemic Serum.—This is an asserted cure for laziness, ugliness, frigidity and many other things. For many years L. D. Rogers, the discoverer of Auto-Hemic Serum, was the chief owner of the National Medical University of Chicago—a low grade school of the "sun-down" variety now out of existence. A few years ago, Rogers was exploiting a cancer serum and selling shares in the "Cancer Research Laboratory and Hospital." In 1915, he exploited a Japanese consumption cure. Then came Auto-Hemic Serum, exploited by means of "The National Society of Auto-Hemic Practitioners" and the "North American Journal of Homeopathy" the official organ of the "Auto-Hemic Practitioners" and of the "American Medical Union." Auto-Hemic Therapy is described as "The Missing Link in Medicine" and "consists in giving the patient a solution made by attenuating, hemolizing, incubating and potentizing a few drops of his or her own blood and administering it according to a refined technic developed by the author." The "technic" of this new therapy may be learned through a mail order course costing one hundred dollars, "cash-in-advance." One of the chief virtues claimed for the serum is that of developing in the patient who takes it an unbounded energy; it apparently makes him want to work himself to death (Jour. A. M. A., Feb. 14, 1920, p. 477).

Eumictine.—The Council on Pharmacy and Chemistry reports that Eumictine is ineligible for New and Nonofficial Remedies because (1) it is unscientific; (2) it is sold under unwarranted therapeutic claims; (3) the name "Eumictine" is blown in the bottle for the obvious purpose of bringing the product to the attention of the public when it is prescribed in the original package, and (4) the name is therapeutically suggestive and not in any way descriptive of its composition. Eumictine is a preparation from the laboratories of Maurice Le Prince, Paris, France, and is marketed in this country by George J. Wallau, Inc., New York. According to the American agent, "each capsule is supposed to contain 20 centigrams of Santalol, 5 centigrams of Hexamethylene-Tetramine" (Jour. A. M. A., Feb. 21, 1920, p. 542).

Du Pont Cotton Process Ether.—Recently the "News Service" of the E. I. Du Pont De Nemours and Co., Inc., circularized the press of the country with a "filler" about "The New Du Pont Ether." The Du Pont Ether and the claims made for it are seemingly based on the work of one man, James H. Cotton, M. A., M. D., Toronto, Canada, who published an article on "Cotton Process Ether and Ether Analgesia." However, Cotton did not give the composition of the "New" ether, nor does his work appear to have been corroborated. In reply to an inquiry from the Secretary of the Council on Pharmacy and Chemistry, the Du Pont Chemical Works declared that the "procedure of manufacture, and the exact composition" of the ether was regarded as confidential information. The use of a therapeutic agent of unknown composition is unscientific and contrary to the best interests of the medical profession and the public, but it is many times more serious for physicians to use a secret or semisecret substance as an anesthetic.

Barbital (Veronal) Addicton.—The constant use of even small doses of barbital (veronal) affects the central nervous system. Those taking the drug habitually become much debilitated and seem less able to stand moderate doses. Death has occurred from a 3 gm. dose in addicts (Jour. A. M. A., Feb. 21, 1920, p. 544).

Antiplasma.—A nostrum called Antiplasma or Rudolph's Malarial Specific is being exploited in the South. It is claimed that the preparation was "developed by J. J. Rudolph, M. D." and that "There is only one way to cure Malarial Fever. Take 15 drops of Rudolph's Malarial Specific on sugar or in molasses, three times daily for six days." The A. M. A. Chemical Laboratory reports that Antiplasma is a pale yellow, viscid liquid having an odor resembling a mixture of oil of turpentine and oil of wintergreen. The preparation responded to tests for rosin, turpentine and methyl salicylate. It was impossible to determine whether the product was a mixture of the three, or some natural turpentine-like product "thinned" with methyl salicylate. The chemists conclude that a mixture of 53 parts of bleached rosin, 41 parts of oil of turpentine and 6 parts of methyl salicylate would probably have whatever anti-malarial properties Antiplasma possesses (Jour. A. M. A., Feb. 28, 1920, p. 618).

Pharmacy by Act of Congress.—For years the manufacturers of "patent medicines" have assured us that the alcohol in their nostrums was used only as a solvent, preservative or extractive agent. Thus Wine of Cardui at one time contained 20 per cent of alcohol and the manufacturer claimed that no

more was used than was needed as a solvent and preservative, and that attempts to substitute another preservative had proved futile. Then came national prohibition and now Wine of Cardui contains 10 per cent of alcohol and its preservative powers have been fortified by the addition of benzoates (Jour. A. M. A., Feb. 28, 1920, p. 607).

CORRESPONDENCE

COMMUNICATION

"To all physicians who served the Federal Government during the War:

"An association of Medical Veterans of the World War was organized at Atlantic City, in June, 1919, at the time of the meeting of the American Medical Association, and a constitution and by-laws adopted. About 2,800 physicians have already joined and all others who are eligible are invited to join the society.

"The Constitution states that 'The Dominant Purpose of this Association Shall Be Patriotic Service. The objects of this association shall be: To prepare and preserve historical data concerning the medical history of the war; to cement the bonds of friendship formed in the service; to perpetuate the memory of our medical comrades who made the supreme sacrifice in this war; to provide opportunity for social intercourse and mutual improvement among its members; to do all in our power to make effective in civil life the medical lessons of the war, both for the betterment of the public health and in order that preparedness of the medical profession for possible war may be assured.'

"The organization of the society provides for state and local organizations wherever the members desire it, and in some states, such as Wisconsin, organization has already been effected.

"It is desired by the National association that those who are already members meet together in larger and smaller groups, at the first convenient opportunity, and effect a local organization with a chairman and secretary, and also at the next meeting of the state medical society that a place be provided on the program for the Medical Veterans.

"The organization of the society is based on democratic principles and it is hoped that the members who have already joined will take the initiative and organize their own state and local societies.

"The national organization will assist by furnishing application blanks and copies of the constitution and by-laws, and, if desired, stationery.

"The first things to be done after the organization of a state society is effected is to elect a councilor to the general council of the organization, to represent the state society at the next annual meeting of the Veterans at New Orleans on the first day of the meeting of the American Medical Association, April 26, 1920.

"A badge or button for members of the society is being made and will soon be ready for distribution."

Yours very sincerely,

F. F. Russell,
Secretary.

Army Medical School, Washington, D. C.

WHY TUBERCULOUS PERSONS WITHOUT FUNDS SHOULD NOT LEAVE THEIR HOME STATES

It is reliably estimated that several hundred tuberculous persons without funds come to Denver every year. Practically all of them come because they have the mistaken idea that climate will cure tuberculosis.

They arrive, almost penniless, without having made any inquiries, or any provisions for their needs. Since Colorado has no state, and Denver no municipal tuberculosis sanatorium (merely a ward at the County Hospital for thirty-five very sick tuberculous residents), the care of such indigent persons is limited to a few free private sanatoria, which are continuously so overtaxed that admittance is a long and difficult matter. These sanatoria comprise: the two Jewish, which accept only a small number of Gentiles; a tent colony of men with a capacity for seventy "down-and-outers"; and a small home for a dozen destitute tuberculous women.

These tuberculous poor who migrate to Denver, finding no place where they can be cared for, look for light work in order to maintain themselves and often their dependent families; but the demand for such work is far in excess of the supply. Driven to any work they can get, with neither friends nor care, anxious, homesick, hopeless, they rapidly grow worse, and usually soon die. They die for lack of proper rest, food, fresh air, and medical attention, those essentials of treatment, which many of them could have had at home—or here with sufficient funds for two years' care. Without these essentials climate is of no avail. If it were, Denver would welcome these tragic health-seekers instead of urging them, for their own best chances, to stay at home.

Denver also urges that the states throughout the country plan definite programs to retain their indigent tuberculous, giving them effective treatment in state sanatoria or in their own homes.

THE DENVER ANTI-TUBERCULOSIS SOCIETY,
221 Coronado Building, Denver, Colorado.

Editor Minnesota Medicine,
St. Paul, Minn.

Dear Sir:

I am arranging for a party to go to New Orleans for the meeting of the A. M. A., going down by boat, to return by rail. If a party of sufficient size can be made up, the boat will be held at New Orleans for sleeping quarters and to serve breakfasts while in

port. A special train will take the party back through the Ozark Mountains.

The details have not as yet been worked out, and they will depend largely on the size of the party. Those interested may get the details by corresponding with me.

HARRY F. THOMPSON, M. D.,
Forest City, Iowa.

PROGRESS IN MEDICINE AND SURGERY

THE ACUTE ABDOMEN: Deaver (Surg. Gyn. and Ob. Vol. 30 No. 1.) points out that the acute abdomen occupies too prominent a place in mortality statistics, and among the reasons for this is the fact that too many untimely and unsuitable operations are performed in the treatment of this serious condition. So it is also in part due to the want of an intimate knowledge of living surgical pathology, in part to a too great reliance on laboratory findings, which do not always correspond to the findings at the autopsy, and furthermore, to a hesitancy to resort to radical measures in the hope the symptoms may pass away under what is called conservative treatment. Radical treatment in such instances would have been truly conservative, because it generally would have conserved life.

The acute abdomen is not, as a rule, the result of virgin pathology. In the majority of instances, it is only the outcome of a chronic pathological process, which has given evidence of its presence for a well marked period of time. The more common of the causes should be recognized, if our patients are carefully studied and examined and our faith has not been perverted as entertaining the foolish belief that chronic ulcer, chronic gall-bladder disease, chronic pancreatitis, etc., can be cured by medicine, diet, visiting one of the famous springs, taking a rest-cure, etc. The traumatic acute abdomen, the wall of which shows a penetration, whatever the laceration, and whatever the agent, should be opened.

Perforations of the gastric-intestinal tube are usually easy to diagnose because of the intense and sudden pain and the early board-like rigidity to which they give rise. But in such varieties of perforation as those occuring in typhoid, particularly the ambulatory type, or the perforation of an unsuspected ulcer of the colon, an exact anatomical diagnosis often cannot be made in time to save the patient's life. The important point is to recognize the presence of an acute abdominal catastrophe and let the exact diagnosis follow upon the revelations of the aseptic scalpel.

There are to be sure certain acute conditions of the abdomen in which surgery is not indicated, and it is these the author places among the "untimely" operations which swell our mortality lists. Prominent among them are, acute dilation of the stomach, acute gastro-enteritis, which may simulate appendicitis, pneumonia and diaphragmatic pleurisy causing upper addominal rigidity and referred abdominal pains. After considering all contra-indications to surgery and all conditions, which simulate acute surgical conditions of the abdomen the greatest toll of life is exacted as a result of delay in diagnosis and instituting proper treatment.

The three dependable conditions necessary for the determination for or against operation are first, experience; second, interpretations of a carefully elicited history, although not feasible in all instances on account of the inability of the patient to express himself; third, **carefully examination.**

In the decision whether and when to operate we must remember certain facts in the natural course of abdominal inflammation, namely: All perforated inflamations tend to generalize; appendicular infllammations have a strong natural tendency to localize and so do cholecystic and pelvic inflammations. Generalization in these cases is usually the result of improper treatment.

E. M. JONES.

MACULAR HOLE IN THE RETINA: A. B. Middleton, M. D. (Am. Jour. of Ophth., Nov. 1919, Vol. 2, No. 1.) The examination of recruits preparatory to the formation of our great American army has brought out many statistics relating to the various specialities in medicine and it is hoped that as time goes on many more of these rare and interesting pictures of disease will be collected together.

In a most enlightening article upon this subject heretofore considered quite rare the author reports and tabulates histories of cases discovered during the examination of recruits suspected of malingering to avoid military service.

Out of 100,000 men examined, Meddleton found 23 who had a hole in the retina at the macula region; in the series 17 cases had round retinal holes and the balance elliptical shaped holes, the long axis being horizontal, the colour of the exposed chorid in the bottom of a retinal hole at the macula varied between a light and a dark cherry red, as a rule there is a halo of pigment in the retinal hole varing in density; a central scotoma is present depending upon the size of the retinal hole.

In this series a greater percentage of retinal hole occurred among the colored recruits than among the whites but it is the authors opinion that given the same environment there would be little difference between the two races.

The article gives complete case histories of each case. All were due to a direct blow upon the eye. Vision in the effected eye was 20/200 while in the uninjured eye it was 20/20. All cases in the series had a dilated pupil of the affected eye which slowly reacted towards light and accommodations and showed retarded power of convergence. In none was

there evidence of fluid vitreous, dislocated lens, traumatic cataract, detached retina or optic nerve trophy.

The article has been illustrated with six colored prints. It would have been more interesting to have seen the entire series, for it is not often that rare conditions can be grouped in such numbers under one heading as this paper describes.

GEORGE C. DITTMAN.

W. H. Fisher, (Ann. Surg. Vol. 70, No. 6) reports a case of suppurative parotitis following a laparotomy for an ovarian cyst. He follows the presentation of this case with a collective abstract on suppurative paratotis. LeDentu advises very early incision in cases of paratitis to avoid massive necrosis of the gland. Because of the dense facial investment and the trabeculae of fibrous tissue extending deeply into the gland so dividing it into lobes, infection may develop in one of these compartments and because of the unresistant nature of this facial investment an actual ischemic necrosis of the parotid may take place. Therefore it is important to incise early and open all these fibrous cavities. The author has made extensive inquiries from surgeons who see a great many traumatisms in the region of the parotid. He found from these inquiries that suppuration rarely if ever followed an injury.

Extension and badly infected mouths by means of Stenson's duct almost never occurs. Although Fenwick reports that in cases of cachexia and malnutrition where rectal feeding was done, suppuration of the parotid often took place. He laid this to stasis of the secretion in the glan and to obviate infection, he would stimulate parotid secretion by having the patient chew on a piece of rubber before each rectal feeding. The physicac nerve which prompts salivary secretion is often disturbed by shock or the anaesthesia in surgical operations and the inhibition of these stimuli causes a stasis in the parotid which makes it more susceptable to infection. This associated with a bacteriemia is probably the reason for postoperative suppurative parotitis. The conclusions drawn from clinical observation and a careful review of the literature are

1. Suppurative parotitis is of hematogenous origin.

2. That cachexia and malnutrition are predisposing factors.

3. That susceptability is favored by stasis.

4. That secretion of the gland is under the influence of nerve stimuli and that the incidents of post-operative parotid involvment is neurally dependent upon surgical shock or inhibition of the secretory and trophic fibres from higher psychic centers.

5. That the gland must be susceptable to pyogenic microörganisms and when affected bacteriemia exists in all cases.

6. That early incision and drainage are indicated.

7. That the surgical technique advised by Lilienthal and Blair should be employed.

H. B. ZIMMERMAN.

SYPHILIS OF THE LUNG. H. Lisser (Am. Jour. Med. Sc., March 1918.) believes that while syphilis of the lung is not common it is by no means rare and is really much more frequent than is usually recognized. It is chiefly confused with phthisis, is usually very responsive to treatment—often producing brilliant cures—and if not treated is surely fatal.

Every case of apparent phthisis which shows no tubercle bacilli in the sputum should be suspected of having syphilis.

The roentgen-ray plate of a luetic lung is quite unlike that of a tuberculous lung, its chief characteristic being peribronchial thickening. Gummata do not present striking shadows but have to be differentiated from malignant growths.

Types include gummata, those showing connective tissue changes chiefly, and those showing parenchymatous changes chiefly.

Gummata may be single, multiple and vary in size and shape.

Fibroid induration is the chief type and most characteristic of lues of the lung.

Symptomatology:—The onset is insidious and rarely recognized until fully developed. This is not true of tuberculosis where we have toxic symptoms with anemia and reflex symptoms due to pneumogastric nerve action such as cough, tachycardia and gastric disorders.

In syphilis this is not true. The process is usually advanced before any change in general health is observed. Patient seems strong, color good, facies normal, appetite and weight remain; in other words, no symptoms of intoxication.

Dyspnea is the chief symptom and usually severe. Cough is spasmodic and exhausting. Sputum; almost none or abundant—negative for Koch's bacillus. Night sweats common. Fever variable.

Diagnosis: 1. Absence of tubercle bacilli in sputum.

2. Disproportion between the gravity of the physical signs, the severity of other symptoms, and the good appearance of the patient.

CHAS. N. HENSEL

THE CARDIAC PHASE OF THE WAR NEUROSES. A. E. Cohn (Am. Jour. Med. Sc. Vol. 158 No 4.) calls attention to the work done under the title of "The Irritable Heart of Soldiers" by Da Costa, an American. Da Costa described the symptoms of palpitation, cardiac pain, shortness of breath, and nervous disorders, such as headaches, giddiness, and disturbed sleep and called attention to the existence in these cases of hyperesthesia of the skin, blueness of the lips and hands, and a mottled condition of other portions of the skin. Indigestion, abdominal

distress, diarrhea, itching and sweating were also noted. Da Costa found mention of such symptoms having existed in the Crimean War, and frequently in the Northern Army in the Civil War.

The condition was recognized by the British in the last war, and in 1916 the Hamstead Military Hospital was set aside for cases of irritable hearts of soldiers. An advisory commission consisting of Drs. Allbutt, Mackenzie and Osler was appointed.

In this country two hundred beds were set aside at General Hospital No. 9 at Lakewood, N. J., and the work there was carried on by Major Peabody.

The author describes a severe case. The patient is obviously distressed, is likely to be thin and have a drawn look. His lips may have a bluish tinge, his skin appears mottled, and his hands purple. A gross tremor not only of the hands, but of the legs and body may be present. He complains of shortness of wind, pains in his chest, palpitation, fatigue or dizziness. On examination the skin feels wet and clammy, there is axillary sweating, hyperesthesia of the skin over the precorium and exaggerated tendon reflexes. The heart is not enlarged. The pulse usually ranges from 90 to 130, a small percent being below 80 and some over 150. The blood pressure shows no change. The breathing is shallow and may be as high as 40.

Mackenzie believed the condition to be one mainly of exhaustion, and injury not alone to the heart, but to the nervous system.

Lewis used the term "Effort Syndrome" for those showing these symptoms without sign of disease which, after all, follow any extreme muscular effort. The symptoms referred to may appear in chronic heart diseases, acute infectious disease, hyperthyroidism and peace neuroses.

The author states that he found heart murmurs in 50 per cent of a series of 214 soldiers who had seen hard overseas service and whom he examined. These murmurs were found twice as often in the recumbant position as in the standing. These murmurs were systolic or post-systolic, and heard at the apex. He calls attention to the fact that these murmurs and the roughening of the first sound sometimes heard when the heart-rate is rapid, of following exercise have often resulted in the faulty diagnosis of mitral stenosis.

Tachycardia, pain and shortness of breath sometimes follow acute arthritis, pneumonia, tuberculosis and typhoid and according to observers trench fever and influenza. Nervous symptoms do not as a rule co-exist, and these cases are not the same as those of irritable heart.

In hyperthyroidism the pulse and respiration do not fall during rest and sleep, and the tremor is fine. Basal metabolism is also increased. The contrary is true in the effort syndrome.

The expression in these cases of irritable heart resembles that of the anxiety neuroses, and some neurologists have made the diagnosis of neurasthenia.

The author goes on to show that this syndrome may be dependent on heredity, personal history and constitutional predisposition. He states that the most timid individuals were soon eliminated on this side of the water, and that the less hardy were the next to develop this condition under the wear and tear of life at the front.

The British treated the condition as a neurosis, but used the term "Disordered Action of the Heart". In the American army the same treatment was imitated, but the term "Effort Syndrome" was borrowed from Lewis and applied.

The author concludes: "In his (Da Costa) view the disorder arose most often as the result of infectious diseases, was most likely a functional disorder, going on to organic change in heart, and was certainly affected beneficially by drugs. The symptoms which he described, and which we recognize are alike. We differ from him in that we think that no matter what the predisposing cause, whether it be infectious disease, malfunctioning glands or internal secretion or gas-poisoning, the disorder is essentially a neurosis, depending on anxiety and fear; that it is removed by the disappearance of the exciting cause and that it is cured by measures designed to influence the neurotic state.

ON THE NATURE OF ECLAMPSIA: By Isei Obata, from the Forensic Institute of the Imperial University of Tokio. (Journal of Immuniology, May, 1919.)

One Dold discovered in the salt solution extract of viscera a poisonous property which can be neutralized by blood serum. This he called "Organgift," but the true nature and property of it has never been fully determined, however, although it has been investigated by many.

If we regard the placenta as an organ, possessing, perhaps, certain peculiarities, and if it is found to contain the poisonous properties referred to by Dold, it seemed to Obata possible that this poisonous property could, under certain peculiarities and conditions, be responsible for the pathology and symptom complex of exlampsia. This he undertook to find out.

The placental extract was prepared as follows:— Immediately after the expulsion of the placenta, the umbilical cord was cut off together with the adjacent part of the placenta; the blood was expressed and the decidual tissue removed. A certain sized piece of cotyledon was cut into pieces and ground in a mortar, and a .85 per cent salt solution added in the proportion of 1:3 by weight. After stirring, it was allowed to stand one half hour at room temperature, then strained through a fine silk. The filtrate was centrifuged and the supernatent fluid, pale pink in color, and having no solid particles in suspension, was designated as placental extract and was the product used. Generally fresh placenta was used but on several occasions a 1-hour refrigerator product was substituted.

The animals used were the Japanese dancing mice, occasionally rabbits, and injections were made into the caudal veins.

"After the injection of a lethal dose of the extract there was an interval of ten to thirty seconds, rarely a minute, before, the animal became excited, and fell at once in a brief clonic or, rarely, tonic convulsion, which was succeeded by a violent dyspnoea, coma and finally death within one to three minutes after the beginning of the convulsion. While the symptoms just described occurred in the majority of instances there were occasional exceptions in which the effects were more prolonged, death following sometimes after hours or days. Even in these cases, however, two symptoms were always noticeable: namely, dyspnoea and convulsions."

Control and duplicate injections were made; it was definitely decided what was meant by a "lethal" dose, and ten hours was set as the limit of time any animal dying after that period of time or recovering from its symptoms was designated as "reaction," the others as "dead." It was soon found that the weight of the animal was not a factor.

The average lethal dose of the extract of fourteen placantae of normal women was from .025 to .15 cc. and the average of seven placentae of eclamptic women was from .019 to .1 cc. which lead the author to the conclusion that the toxic property of the two was not sufficient to distinguish between them.

In comparing the toxicity of the serum of normal and eclamptic individuals, the fresh serum was injected intravenously and it was found to be followed by toxic symptoms differing only in severity from those produced by the injection of the placental extract and coming on after a longer period of time after the injection.

Using the serum of men, non-gravid women, healthy gravidae, healthy puerperal and eclamptic women, he found that there was no significant difference in the toxicity of the serum of the different groups; nor between the serum of the eclamptic and that obtained after her recovery.

He then proceeds to compare the neutralizing power of the serum of normal and eclamptic women on the placental extract. To do this he took 1 cc. of the placental extract to which had been added from .7 to .025 cc. of serum and enough salt solution to make a quantity of 2 cc. and this was injected after an incubation period of one hour at 37 degrees. Taking again the serum of men, non-gravidae, healthy gravidae and healthy puerperal women, he found tbat their neutralizing power was remarkably uniform, it taking only from .2 to .3 cc. of the serum to neutralize the toxic property of the 1 cc. of the placental extract. However, in eclamptic women during the attack it took as much as .6 cc. of the serum to have the same effect; but the normal neutralizing power of the blood was restored in four or five days after the attack, it then requiring only from .3 to .4 cc.

This diminished neutralizing power of the serum might be cause or it might be effect; it might produce the convulsion or it might be produced by the convulsion. To determine this point, the serum of three rabbits was tested in regard to its neutralizing power before and after a convulsion produced by the injection of toxic placental extract, and it was found to be the same, so he concluded that, in the rabbit at least, the convulsions do not alter the neutralizing power of the serum.

In studying the comparative neutralizing power of the non-pregnant and the pregnant animals, he found them to be the same and so concluded that the power of the blood in this respect is not increased during pregnancy and this argues against an immunological origin of the neutralizing power of the blood.

He then proceeded to compare the pathological anatomy of the animals that were killed with injections of placental extract with that of eclampsia. He killed several mice and rabbits with large lethal doses of placental extract and found post-mortem a fairly marked agreement in the pathological anatomy of the two groups. In order to make the work more exact, however, he injected sub-lethal doses over a period of from seven to twelve days and his conclusions, stated verbatim are as follows: "From the preceding descriptions an agreement is apparent in the pathology of eclampsia and that of the animals killed with placental extract excepting the slighter alterations met with in the kidneys of the latter."

CONCLUSIONS: Since these experiments show that the serum of eclamptic women is reduced in its power to neutralize the toxin of placental extract, to regain its full power in four or five days after the attack; and since this reduced power has been shown not to be due to the convulsion; and since a marked agreement has been found to exist between the symptoms of placental extract poisoning and the eclamptic attack, and an almost perfect agreement in the pathological anatomy of the two conditions, the author concludes that "the true nature of eclampsia is nothing more than an intoxication by the placental poison which is made possible by a weakening in its normal capacity of neutralization on the part of the maternal blood."

The author admits that the symptoms and pathology revealed by these experiments are not peculiar to placental extract poisoning, but he argues that in eclampsia that the toxin should come from the placenta seems to be supported by the fact that the symptoms cease when the placenta is eliminated.

That we do have a post-partum eclampsia is true, but rarely after 24 hours, and the symptoms of placental extract poisoning in some cases did not show themselves until ten hours after injection. These late eclamptic manifestations may also be due to the process of involution as even the uterus has been found to contain this "Organgift."

The author is still investigating the question

of why or what reduces the neutralizing power of eclamptic blood.

Then follows a very interesting and instructive historical review, with comments by the author, of the various theories concerning eclampsia that have been advanced from time to time.

1. The theory of uraemia which is no longer tenable as the two differ in clinical symptoms and in respect to the blood findings. An accumulation of urinary products is not demonstrable in the blood of the eclamptic.

2. The theory of a reflex effect of pressure in the pelvis of the kidney, produced, primarily, by the pressure on the ureter at the brim of the pelvis by the head of the fetus. Eclampsia often takes place when the head of the fetus is not in a position to make pressure on the ureter.

3. Bacterial theory. One Gerdes isolated from the placental site of the uterus of eclamptic women an organism which he designated Bacillus Eclamptica, but which Hofmeister recognized as the proteus vulgarus.

4. Zweifel suggested an intoxication by lactic acid which he found in the urine and serum of eclamptic women, and because he found it in gravidae who were nephritics he concluded that it was not caused by the convulsions. This does not hold as increased lactic acid is found in women suffering from nephritis, not from eclampsia.

5. In the category of uraemic and lactic acid intoxications might be placed acetone and creatinin poisoning, both of which views are lacking in proof.

6. Autointoxication caused by metabolic products. if the liver is normal and carries on its functions, all metabolic toxines are thoroughly neutralized but when it is not normal these toxines accumulate, which would make the serum of the eclamptic, or even the pregnant woman, more toxic than the normal—a conclusion not confirmed by the present investigations.

7. Kollmann and Dienst found a large excess of fibrin in the blood of the eclamptic woman which they thought was due to globulin from the fetus and retained in the maternal blood because of imperfect kidney function. This would make the serum of eclapmtic women more toxic than that of normal women, a requirement not met by facts. Furthermore, Lamsback collected from the literature 68 cases of eclampsia occurring after the death of the fetus, in nine of which the uterus was not accupied by a fetus at all but by a hydatiform mole.

8. The above argues against the theory of Kinoshits who produced eclamptic symptoms followed by death in animals by injecting the albumin-free extract of the animal fetus. This substance he called "eclampsin."

9. The placenta received its share of attention. Veit, after he showed that syncytial cells actually gained access of maternal circulation, expressed fluid from the placenta and injected it into rabbits which later developed albuminuria. He observed that the serum of such a rabbit acquired the property of dissolving these syncytial cells which he attributed to an immunological product called "syncytiolysin". He assumed that when eclampsia developed it was due to the fact that the syncytial cells entered the maternal circulation faster than they could be taken care of by the process of syncytiolysin, and when they entered more slowly an albuminuria developed. If this is true then the serum of the pregnant woman should show a greater neutralizing power against placenta extract poison than that of man or the non-pregnant woman, a requirement not fulfilled in the present investigations.

10. Liepmann found that when he made a salt solution emulsion of the placenta of eclamptic women and injected it into the abdominal cavity of rabbits that it was especially toxic. This is not confirmed in the present investigation.

11. Weichardt assumed that antibodies in the maternal blood stream dissolve placental cells and liberate a toxine called "syncytiotoxine". Normal blood possesses an antitoxine mechanism which is disturbed in eclampsia. This theory is strongly supported by the present investigations and experiments for the latter show, for the first time, a great difference in the neutralizing power of the serum of normal and eclamptic women against placental extracts.

12. Hofbauer claimed that eclampsia was an intoxication due to a substance derived from the liver by a process of autolysis under the influence of a ferment produced in the placenta and discharged into the maternal blood. This requires that the blood of eclamptic persons should be more toxic than that of normal persons which is not supported by the present experiments.

13. Many observers believe that anaphylaxis is induced, during pregnancy, by fetal serum, placenta or amniotic fluid. There is much doubt expressed as to the correctness of this theory.

ALBERT G. SCHULZE.

DIAGNOSTIC SIGNIFICANCE OF THE FIRST SOUNDS OF THE HEART: Le Roy Crummer, M. D. (Am. Jour. Med. Sc. Vol. 159, No. 1.) calls attention to the importance of heart sounds as distinguished from murmurs.

Murmurs are of less diagnostic value than they used to be. The author points out the difference in abnormal hearts in tones produced by right ventricle and heard best over the left border of the sternum in the fourth or fifth interpace and the left ventricle sounds heard just above and within the apex beat.

The tricuspids being rarely affected the right first sound is proffered as the standard in most cases for comparison with the left first sound.

The right and left first tone being probably a combined production of valve leaflet closure and muscle tension, one or the other components may predominate in diseased condition. According to the theory

of Maritius, supported by Howell, the first apical sound is produced during the closed ventricular period. A systolic murmur replacing the first sound left indicates a leakage. If only replaced during exercise a relative insufficiency exists due to myrocardial degeneration.

In aortic regurgitation the first sound left is more pronounced when the leakage is due to an infective process as the degeneration type is likely to involve the myocarduim and thus produce a diminution in the muscular element of the sound.

In case the first sound left is changed in quality such change persisting thru exercise, be suspicious of a mitral stenosis. The typical response of these cases to exercise with the developement of dyspnoea and peripheral cyanosis may make a diagnosis possible. The size of the heart must indicate which lesion is the more predominant in a double mitral condition.

The first sound right and left is shortened and typical of Graves' disease. In neuro-circulatory-asthenia the first sound right may be normal but as a rule in cases of rapid heart action are much like those in thyroid cases.

In approaching death following infectious disease or shock, the tone of the first sound both right and left is decreased and 24 to 36 hours before death the tick-tack heart is heard in which first and second sounds are alike. Six to twelve hours before death one sound is lost. The author has never found any improvement in the heart sounds from stimulating after these tick-tack heart tones have appeared.

Reduplication of the first sound, though common, has no significance alone. With the institution of gallop rythm in addition it has the utmost significance. Gallop rythm he believes a positive indication for digitalis.

THE CEREBROSPINAL FLUID IN MULTIPLE SCLEROSIS: Joseph E Moore (Arch. Int. Med., Vol. 25 No. 1.) reports his studies on cerebrospinal fluid in multiple sclerosis with special reference to Lange's colloidal gold test. He briefly reviews forty cases from the literature, fourteen of which gave a typical paretic curve, twenty-five were negative and one gave an atypical curve. According to Rotstadt, there was no pleocytosis in 75 per cent of his cases. The author reports twenty-eight cases observed at Johns Hopkins Hospital. In twenty of these, a definite clinical diagnosis of multiple sclerosis was made; in the remaining eight, the diagnosis was questionable. In the twenty definite cases a paretic gold curve and a positive globulin were observed eighteen times or in 90 per cent. The author feels that in the eight questionable cases, the diagnosis was probably not multiple schlerosis because of the atypical findings in the spinal fluid. In three of these, the gold curve was in the syphilitic zone and negative in five cases.

In his summary he states that: "Together with the clinical evidence, it is believed that the spinal fluid picture is fairly constant, and that, other things being equal, such a picture is a strong argument in favor of a diagnosis of multiple sclerosis. In its absence the diagnosis becomes at least doubtful."

E. M. Hammes.

TREATMENT OF CHRONIC DACRYOCYSTITIS: W. L. Bennedict, M. D. and R. A. Barlow, M. D. (Am. Jour. Ophth., Vol. 2 No. 12.) The treatment of chronic dacryocystitis is ultimately surgical, the procedure to be employed depending on the nature and position of the obstruction, extent of the involvement of contiguous structures and changes produced by disease or previous treatment. Destruction of the sac by actual or potential cautery is not advocated. Extripation of the sac after the method of Meller gives satisfactory results in most cases.

As the authors state the treatment of choice is one which restores the function of the sac and provides adequate drainage of diseased ethmoid cells in the neighborhood of the duct.

The operative treatment as performed by the authors is that originated by J. M. West and described as Intranasal Dacrycystostomy or intranasal drainage of the lacrimal sac.

Two drops of a one per cent solution of cocaine are instilled into the eye. This allows the passing of a probe through the punctum. Intranasal anesthesia is obtained by blocking the sphenopalatine ganglion and the anterior ethmoidal nerve by introducing a cotton applicator impregnated with cocaine mud and adrenalin beneath the posterior end of the middle turbinate and a second applicator passed between the septum and middle turbinate to the cribriform plate. These are allowed to remain in the nares for ten minutes. A lacrimal probe is now introduced through the lower punctum into the sac and duct as far as it will go, this serving as a guide and land mark.

The mucous membrane of the agger nasi is now elevated and resected; a flap 1 Cm. in diameter is removed from in front of the attachment of the middle turbinate. The bone is next removed by means of a small chisel making a window slightly smaller in diameter than that of the mucosal opening. The inner wall of the lacrimal sac is now exposed; diseased ethmoid cells discharging into the duct are now broken down; the lacrimal probe is manipulated so that the sac wall in the bony opening is tented into the nose; this incised; the portion of the sac removed is made circular corresponding to the bony excision.

The probe is now removed and the sac irrigated through the punctum. This completes the operation and no packing is necessary. The patient is cautioned not to blow the nose too hard. For the first week a solution of zinc sulphate and adrenalin is used.

George C. Dittman.

THE HEART IN BRONCHOPNEUMONIA: T Stuart Hart, M. A., M. D., (The Am. Jour. Med. Sc., Vol. 158, No. 572, Nov. 1919.) believes that in the majority of these patients the heart does its work remarkably well. The cardiac activity seems to be very similar to the conditions which are observed in uncomplicated typhoid fever. We have a relatively slow pulse-rate, a low blood-pressure, both systolic and diastolic, with a fairly good pulse-pressure, a normal rhythm which rarely becomes irregular. The writer has observed extrasystoles on a few occasions, but not once has he found the development of complete irregularity. The heart sounds are of good quality and murmurs rarely develop. Undoubtedly the marked cyanosis has suggested the thought that the right heart was failing, but if one observes his patients closely he will rarely find other signs to corroborate this point of view. There is no increase in cardiac dullness to the right, no marked epigastric pulsation, no stasis, no exceptional pulsation or distention of the veins discharging into the right auricle. The cyanosis which is so prominent a feature must be explained on grounds other than insufficiency of the right heart. The writer is personally convinced that the ordinary cause of death is not heart failure. The heart usually preserves its efficiency up to a few hours before the termination, and then only gives way against overwhelming odds.

In the few uncomplicated cases carefully studied postmortem by Dr. A. A. Eggstein the heart showed only a moderate degree of myocardial degeneration and failed to lend weight to the view that death was due primarily to myocardial insufficiency. A number of the writer's cases died with evidence of pulmonary edema, but even in these the heart seemed to be performing its part with reasonable efficiency.

The fatal termination presented the picture of an overwhelming toxemia. As evidence of this may be cited the extreme cyanosis, the leukopenia, the diminished coagulabitity of the blood, the fever, the delirium which so frequently develops in the severe cases and in the less severe that are protracted, and the great mortality in pregnant women. Certain of the phenomena point to a defect in the capillary wall as an important element; others suggest fundamental alterations in the elements of the blood. Incidentally, it may be stated that a number of observations on the carbon dioxide content of the blood showed this to be normal in every instance. This would indicate that the cyanosis is not due to a condition of acidosis.

In summarizing his findings the writer concludes:

That individuals with chronic cardiac valvular disease withstood the toxemia of the pneumonia of this epidemic very badly.

That individuals with normal hearts, who developed pneumonia, did not ordinarily die from cardiac insufficiency, and the postmortem examinations offer no proof that these hearts were essentially damaged.

That digitalis acts on the cardiac apparatus of these pneumonias in the same manner as in a similar series of hearts without complicating pneumonias.

That digitalis reduced the heart-rate only in cases of auricular fibrillation and in cases where it was administered in quantities sufficient to produce an actual auriculoventricular block.

That the administration of digitalis did not influence blood pressure.

In view of the apparently widespread belief that death in pneumonia is usually due to heart failure and the almost universal dependence that is placed on digitalis is this condition, it behooves us to examine critically the fragments of evidence which we have been able to accumulate in the recent epidemic.

The employment of a method directed against a wrong conception of the pathology may lead to a false sense of security and keep us from directing our efforts to secure remedies better fitted to combat the true pathological condition.

E. T. F. Richards.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

After-Treatment of Surgical Patients. Bartlett. Vols. 1 and 2. C. V. Mosby Co., 1920. $10.00.

Introduction to General Physiology. Bayliss. Longmans, Green & Co., 1919. $2.50.

American Illustrated Dictionary. Dorland. W. B. Saunders Co. 10th Ed., 1920. $6.50.

Practical Organotherapy. Harrower. Harrower Laboratory, 1920.

Medical Clinics of North America. Vol. 3, No. 3, Nov. 1919, W. B. Saunders Co.

Roentgen Interpretation. George W. Holmes and Howard E. Ruggles. Lea & Febiger, 1919. $2.75.

The author before proceeding to outline abnormal processes briefly mentions some of the confusing shadows and artefacts normally found in certain cases under various conditions. Occasionally lines of the epiphysis, one bone overlapping another, or markings of a blood vessel may be mistaken for a fracture. Then too, roughening of the margins of bones may simulate a periostitis. Calcifications frequently occur in blood vessels, cartilages, tendons, tuberculous glands, foreign bodies and tumors. In rapid growth and healed infections, there may be increased density in the spongy bone. Anatomical variations and the stages of development must always be present in the minds of those who study X-ray phenomena. The skull may show absence of certain bones, variations in the width of the sutures, or sinuses varying greatly in size and shape. Not infrequently extra vetebrae, extra bodies, or portons, lack of union, long or short processes are found pressing on nerves. Cervical and upper lumbar ribs are frequently demonstrated. Variations, deformities, partial or total absence of scapulae, tarsal or carpal bones occur too frequently not to be remembered.

In fractures and dislocations, the author calls special attention to rule out normal shadows, to take a stereoscopic picture wherever possible and lastly to take at least two plates at right angles one to another. Again, in the inflammatory diseases of the bone, such as osteomyelitis, tuberculosis, syphilis, typhoid, actinomycosis, leprosy, etc., great emphasis is placed on the systematic examination of the medulla, cortex, and soft parts. One should also try to determine whether or not the lesion is multiple, invading the epiphysis or the joint. In addition, careful examination of the neighboring bones for destruction, proliferation, or both should not be neglected.

A list of the benign as well as malignant bone tumors has been carefully prepared and discussed. Pulmonary osteoarthropathy, acromegaly, rickets, scorbutus, achondroplasia, (osteogenesis imperfecta) osteomalacia, and other diseases of nutrition have been outlined with their differentiating characteristics in some detail. The chapter dealing with the skull, its contents, sinuses, mastoids, teeth and fractures, has been prepared in a most interesting manner. Too much cannot be said about the many conditions which affect the joints, tendons and bursae. In enumerating and discussing these states, our attention is called to the periarticular swelling in the soft part, to the effusion in the joint, to the erosion of cartilage, to the changes in density of the bone, to the outgrowths of new bone formation and finally, to the number of joints involved.

It would be most unfair to try incorporating even in a rudimentary manner in this review, the various conditions of the chest which have been most elaborately discussed by the author. Gastro-intestinal technic with the interpretations of the numerous lesions occupies a very important place in the whole work. The genito-urinary tract has been given also the most careful consideration.

In conclusion, it may be of value to mention that the book is composed of nine chapters; has over two hundred well chosen illustrations of the various types of lesions. A rich bibliography following each chapter with a complete index at the end of the book, make this volume most attractive to anyone interested in the progress of medicine.

JOHN A. LAPEK.

Practitioner's Manual of Venereal Diseases. A. C. Magian, M. D. C. V. Mosby Co., St. Louis, 1919. $3.00.

The author enumerates thirty-three remedies used in the treatment of acute gonorrhea, among them glycothymoline, and in the treatment of congenital lues he mentions the value of tonics, and enumerates among others Sanatogen, Valentine's beef juice and Virol. Such ideas almost spoil a good work, for the author gives evidence of being a progressive teacher when he begins his chapter on the treatment of syphilis as follows:

"Before going into the details of the modern treatment of syphilis, I would make the following suggestion to every practitioner. Rid your library of every work on syphilis that is not absolutely up to date. Old-fashioned treatment and ancient methods of diagnosis are the curse of the man who wants to rise out of the common groove. Too many of us are content to carry on with the teaching given us in our student days. As far as the treatment of syphilis is concerned that teaching is obsolete."

The modern treatment which is given is surely to be commended to the practitioner. Owing to the historical references the work is more interesting than the average manual.

E. C. GAGER.

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ORIGINAL ARTICLES

SURGERY OF THE KIDNEY*

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The improvement and development of the surgery of the kidney have been brought about largely by a better understanding of the pathology, and also by the more modern methods of clinical and laboratory examination which have enabled us to determine more accurately than heretofore the existing condition. Important changes have also been made in the surgical technic.

Congenital anomalies.—Some of the congenital anomalies which affect the kidney may have a very important bearing on any surgical procedure. The horse-shoe kidney occurs quite frequently, and in certain cases one-half of it may be diseased and the other half normal. This condition will often be encountered without any previous knowledge of its presence, and the fact that the two kidneys are fused adds greatly to the difficulties of the removal of the diseased portion. It should also be remembered that one kidney may be imperfectly developed or that there may be a congenital absence of one kidney. These conditions especially call attention to the importance of determining whether or not both kidneys are present and what their functional capacity is before any operation is undertaken. Should it be impossible to make sure that both kidneys are present and functioning at the time of the examination, it may be necessary to explore both sides before deciding to remove the infected kidney. If one kidney is absent or not functioning, the remaining kidney will be twice its normal size.

The kidney may be congenitally displaced, and if so it is usually found at a level with the promontory of the sacrum. This condition is known as pelvic or ectopic kidney and differs from the floating or movable kidney in that the renal vessels may arise from the common or internal iliac vessels, and the pedicle of the kidney may be short so that it is more or less fixed in the pelvis. A pelvic kidney may be normal in functionating capacity and cause no trouble, or it may be afflicted with any of the pathologic conditions which arise in a normal kidney. A kidney in the pelvis is of great importance from the standpoint of diagnosis. Several times a right side infected ectopic kidney has been approached on the presumption that the condition was an appendiceal abscess. It seems advisable to have a pyelogram made in all the uncertain cases of pelvic tumor in which an ectopic kidney may be the tumor. In a series of 19 cases of pelvic kidney previously reported 9 of the patients required operation because the kidney was pathologic. In the other 10 cases, the kidney was apparently functioning normally.

The movable and the floating kidney have ceased to occupy an important place in surgery. At one time the surgeon considered it advisable to fix in the normal position all kidneys that seemed to lie too low or to be too movable, but at the present time, the mere position of these kidneys is not deemed an indication for operative treatment. Usually, this condition of general visceroptosis is associated with the syndrome of general neurasthenia and will not be benefited by surgery. Undoubtedly, at times the floating kidney assumes a position which causes a change in the position of the ureter, so that the flow of the urine is obstructed and an intermittent hydronephrosis, which can be determined by a special examination, results. In such cases

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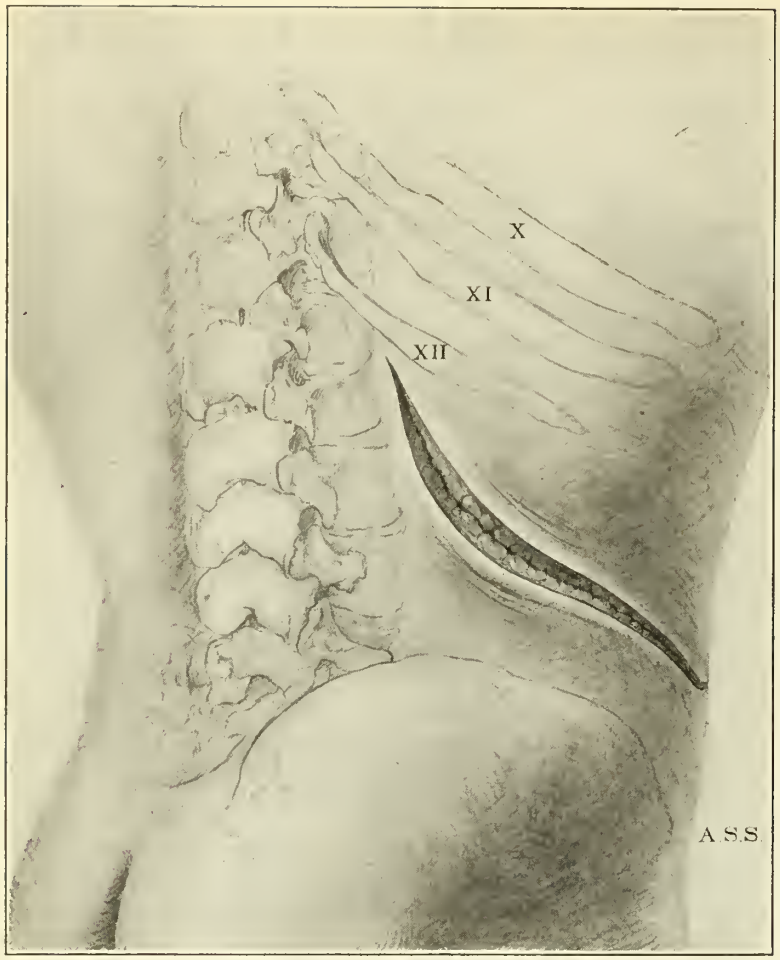

Fig. 1. Line of skin incision in kidney operations as previously suggested by Dr. W. J. Mayo.

surgical treatment is usually advised, although it does not always obtain the best results. Occasionally, it may seem advisable to fix a floating kidney to relieve symptoms produced by its abnormal position; but more often interference with function is the factor which decides whether or not operation should be done.

Contusion and rupture of the kidney.—This injury may occur without any external evidence of trauma over the kidney area. The initial symptom is bloody urine and, if the injury is not extensive, this may subside without further trouble. If the hemorrhage is severe and continuous I believe it is advisable to explore early, in view of the fact that the lacerations may have extended through the pelvis or involved the ureter, and, as a result, the parenchyma will surely become infected, eventually destroying the kidney. In some of these cases, the injury to the vessels, ureter, and pelvis is undoubtedly not so great but that they could be repaired by an early operation; this will enable the kidney to functionate again. After the infection occurs in a ruptured kidney the chance of saving it is slight. Nephrectomy will often have to be resorted to in cases of severe injury.

Hydronephrosis.—If the escape of the urine from the kidney is suddenly and completely arrested by ligation of the ureter, the organ ceases to secrete, and finally undergoes atrophy. It might be expected that an unfavorable prognosis would follow ligation of the ureter and that eventually the kidney would have to be removed, but in not a single case of the many instances in which we have been obliged to ligate the ureter has a demonstrable hydronephrosis developed, and in no instance has it been necessary to remove the kidney. Experimental work on animals, and Caulk's operative work on man have demonstrated that if the ureter is liberated after it has been ligated completely and has remained closed for as long as 14 days, the kidney tissue will gradually recover and functionate normally. Hydronephrosis, then, will not result from the ligation of the ureter, but it may, and usually does result from hinderance to the flow of urine during a long period. The altered position of the kidney or the pressure of an anomalous vessel on the ureter may eventually result in a hydronephrosis. At first the hydronephrosis will be intermittent; later, after changes have occurred in the kidney tissue, especially in the pelvis, the hydron-

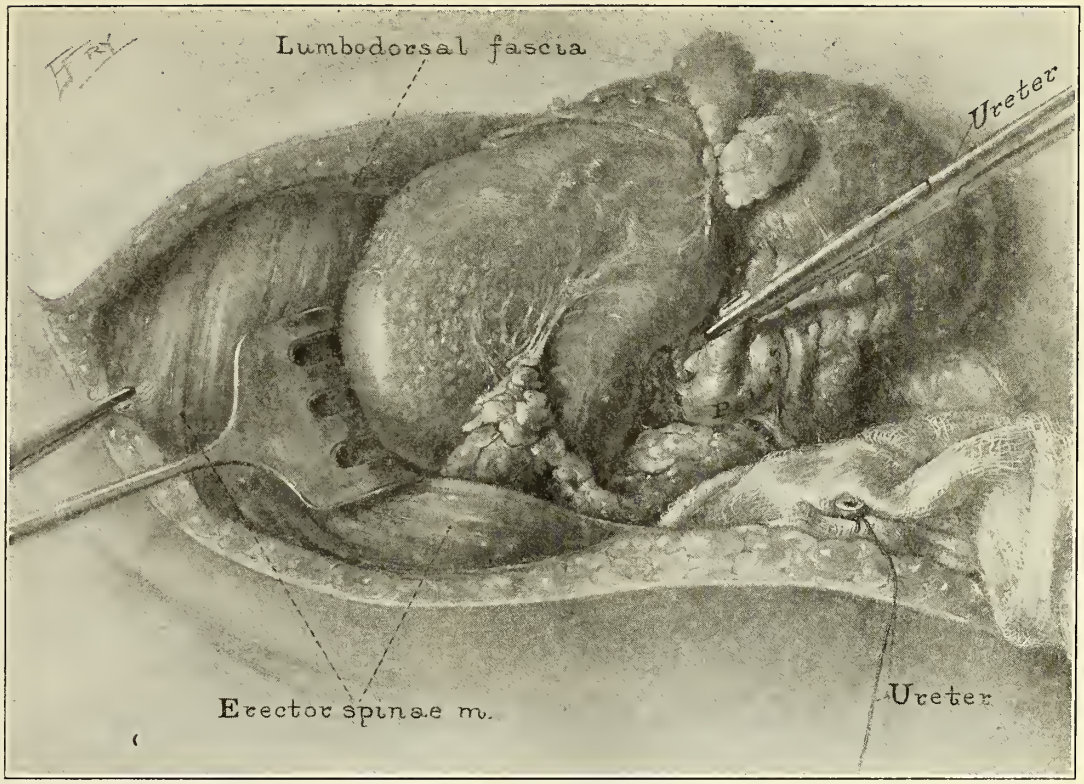

Fig. 2. Kidney delivered into wound, ureter ligated a nd dropped back, ready for invagination into tube.

ephrosis will become permanent. A small hydronephrosis, with some dilatation of the calices, is not uncommon and may exist without producing symptoms. In view of the fact that surgery is not always satisfactory in these cases, it seems best not to be too urgent in advising it. If an anomalous vessel is the cause, the condition will be relieved by the division of this vessel, provided the hydronephrotic sac is not too large. If the cause of the condition is a stricture or an angling of the ureter a plastic operation at this point of the ureter would seem to be indicated. A number of these plastic operations have been done in the clinic in cases in which hydronephrosis was sufficient to produce marked symptoms and yet had not resulted in any destruction of the kidney. The results in these cases have not been generally satisfactory. Some patients have had recurring trouble which required nepthrectomy. The operation rescribed by Peck, "splinting the ureter", has proved very satisfactory in some cases. If the hydronephrotic sac is large and the calices markedly dilated, it will be best to resort to a nephrectomy if the other kidney has been found to be normal. Undoubtedly these conditions are more than a mere dilatation or they would be entirely relived by a plastic operation at the point of narrowing.

Pyogenic infections.—Pyogenic infections of the kidney are common, and in most instances surgical treatment is indicated. If the infection takes the form of a pyelitis or a pyelonephritis, however, both kidneys are usually involved, and little can be accomplished by surgery. A common type of infection in the kidney occurs from several days to several weeks following attacks such as of tonsillitis and boils. The kidney receives the organism through the blood stream and the involvement occurs in the form of a single abscess or, more often, multiple cortical abscesses. This is indicated by chills, a rise in temperature, and a high leukocyte count, and usually by much local pain and tenderness, especially if the infection extends into the perinephritic space. A large perinephritic abscess sometimes forms, drainage of which is frequently sufficient. If multiple abscesses are found in the cortex

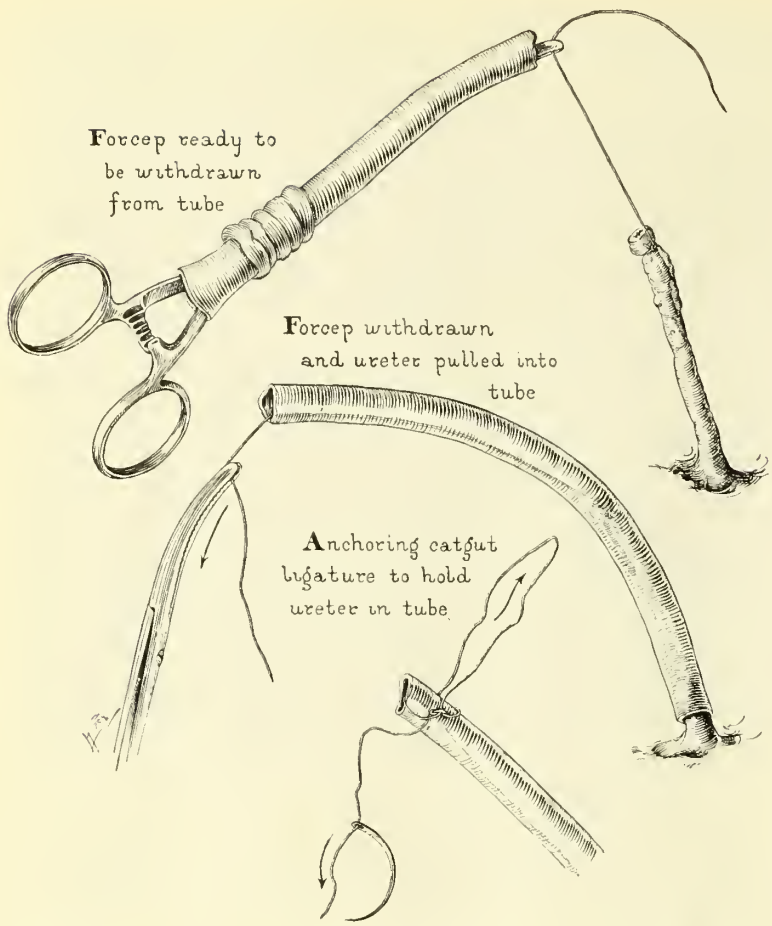
Forcep ready to be withdrawn from tube
Forcep withdrawn and ureter pulled into tube
Anchoring catgut ligature to hold ureter in tube

Fig. 3. Method of isolating cut off area, of a tuberculous ureter.

with considerable destruction of the kidney substance, a nephrectomy is indicated.

Pyonephrosis is that form of infection in the kidney in which suppuration is combined with obstruction to the outflow of the urine. This condition may result from infection associated with hydronephrosis or with stones in the pelvis or renal tissue. Bilateral pyonephrosis is frequently encountered in cases of severe cystitis complicated with prostatic enlargement and bladder stone. If the pyonephrosis is unilateral, nephrectomy is often advisable. In some cases in which the infection is not severe or in which there is some contraindication to performing a nephrectomy the kidney pelvis and the kidney tissue may be drained although under ordinary circumstances the establishment of drainage in an infected kidney is not altogether satisfactory. It is often difficult to decide just how to proceed in cases of bilateral pyonephrosis. Many of these cases are associated with stone formation, and the phenolsulphonephthalein output may be low and the blood urea high. It seems to me that the most conservative method, the removal of stones from one kidney at a time, is best. In occasional cases a subcapsular nephrectomy will be required later because of remaining infection and persistent sinuses, but this can be done at a time when the better kidney has resumed a good function. I believe that it is easier for the patient, even in the cases of non-infected bilateral nephrolithiasis, to have one side operated on at a time, the second operation to be performed as soon as complete convalescence has taken place following the first. Stones in the kidney are most often formed in the pelvis or in one of the calices, although they may occur in the kidney tissue. Calcareous formations in the kidney are frequently multiple. They are ordinarily determined by x-ray examination, but even when the x-ray shows only a single shadow the possibility of a number of stones must be considered. I am convinced that the reported frequency with which kidney stone is found following operation is largely due to the fact that small stones are overlooked at the time of the operation. In operating it is always advisable to deliver the kidney from the wound in order to get good exposure. When it is possible the stone should be removed through an opening in the pelvis, although an incision into the cortex is better handled now than formerly. It is always wise to make an opening in the pelvis large enough to intro-

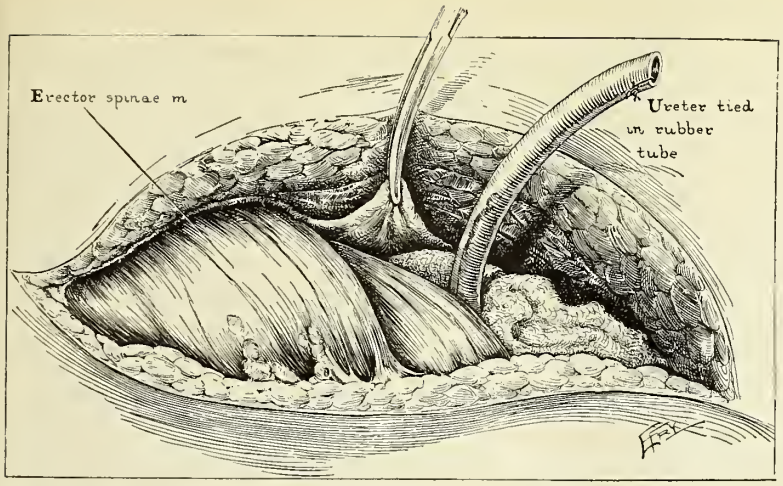

Fig. 4. Tuberculous ureter fastened in rubber tube isolating it from the surrounding tissues to prevent soiling.

duce a finger to explore the calices. This is the best method by which to find stones. It is surprising how large a stone in the kidney may escape notice if the pelvis is not opened and examined from the inside. It has been considered indiscreet to suture these openings in the pelvis or ureter but I believe that this can be done safely with fine, plain, quickly-absorbable catgut; certainly the suture adds greatly to the convalescence as in many cases no urine will drain at any time. The contraindication to closing the kidney pelvis or ureter is the severe infection which may exist.

Tuberculosis of the kidney.—Tuberculosis of the kidney is a common finding. In every instance in our cases in which tuberculosis bacilli were found in the urine coming from the ureter, a definite tuberculous process was demonstrated in the kidney. It is of the greatest importance to recognize the condition while the process is confined to a single kidney. When only one kidney is involved, the ultimate results of its removal will be very good, but if the condition has reached the other kidney, no form of treatment is effective. Under ordinary circumstances, if one kidney is extensively involved and the other only slightly, the one showing greatest destruction should be removed unless there is evidence that the disease is general. Undoubtedly tuberculosis of the kidney if often secondary to tuberculosis of the lungs. A healed lesion in the lung, or a fairly inactive one, is not a contraindication to removal of a kidney in which an active tuberculosis exists. It adds to the risk, but the operation offers the patient much more than any other treatment. (Fig. 1.)

In the technic of the removal of a tuberculous kidney, the perirenal fat must be removed completely and the cut end of the ureter isolated, or the entire wound may become infected and tuberculous with very serious results. Tubercles are found in the tissues of the ureter, and in many cases in the bladder. Removal of the entire ureter has been advocated but this adds greatly to the extent of the wound and does not accomplish its purpose, as a ureter cut off at the bladder offer the same opportunity for soiling as it does when cut off at the kidney pelvis. To prevent infection from the cut end of the ureter W. J. Mayo devised the plan of suturing the end of the ureter to the skin so that it prolapses out of the wound. Sometimes it is difficult to free the stiff ureter sufficiently to get it entirely out of the wound. If this cannot be done the end of the ureter is freed for several inches and the ligated end is threaded into a rubber tube, which is allowed to project from the wound for at least six days. In this manner, any soiling from the cut end of the ureter is carried to the outside by the tube and is not poured into the perirenal tissues. The results following these procedures of isolating the ureter after nephrectomy for tuberculosis of the kidney indicate their great importance. Figs. 2 and 3.)

Tumors of the kidney.—A study of renal tumors shows benign tumors of the kidney to be very rare. Solitary cysts that may be enucleated from the kidney are sometimes seen. Congenital, bilateral polycystic disease is more common, but it is not particularly amenable to surgical treatment. Patients are usually very anemic and have a low kidney function. If one of the cystic kidneys is also infected and the other is free from infection, it

is sometimes advisable to remove the infected organ. Our experience with the Rovsing operation, which consists in collapsing the cysts in first one kidney and then the other, has not been entirely satisfactory. The common tumors of the kidney are malignant, either hypernephroma or carcinoma in the adult, or sarcoma in children. The results of nephrectomy for hypernephroma have been more permanent than those of most operations for malignancy. The tumor develops slowly and, if operated on before it becomes fixed by attachments formed from extension, especially through the pedicle and extensive lymphatic involvement, the results are very satisfactory. If the tumor is large and fixed no operation should be attempted, and it may be well to use radium. Some of our patients with inoperable tumors who otherwise were in fair condition have seemed to do very well under this treatment. Operation for carcinoma, and for sarcoma of the kidney in children is less favorable; while a very large tumor may be removed successfully it will usually recur early. (Fig. 4).

The technic of operation.—I wish to call your attention to the incision which we have found most useful in exposing the kidney. This was described by Dr. W. J. Mayo some years ago. (Fig. 1.) It combines the advantages of the so-called posterior and anterior incisions, adding materially to the facility with which these operations may be performed. It is crescentic, beginning well forward on the flank above the spine of the pubic bone, extending backward and upward to the point of articulation between the last rib and the vertebrae. The incision must extend far enough forward to give a good exposure of the pedicle in cases in which the pedicle is short and the kidney high-lying. The operation is extraperitoneal throughout. The important sensory nerves come into view readily and are preserved. In some instances it is necessary to cut through the muscles. Second, the perirenal fat should be extensively removed in all tuberculous and malignant cases. Third, the cut-off end of the ureter should be isolated in all tuberculous cases, in such a manner that it will not soil the wound. This may be accomplished by fastening the ureter outside the wound or isolating it by threading it through a rubber tube. Fourth, the pedicle consisting of the renal vessels should be caught by two clamps. When tying the pedicle, the deeper of the two clamps is released while the ligature is being tightened onto the pedicle; in this way the pedicle is controlled by the ligature and also by the second clamp. Another ligature is then placed on the pedicle before the second clamp is removed.

The points to be emphasized in operations for the removal of stones from the kidney are, first, exposure of the kidney by displacing it from the wound; second, careful exploration of the kidney pelvis and calices with the finger in order to avoid overlooking any stones; and third, closure of the incision in the kidney pelvis in non-infected cases.

Table 1

OPERATIONS ON THE KIDNEY IN 1918

	Cases	Deaths
Perinephitic abscess—drainage	7	
Anomalous kidney—exploratory pelviotomy	1	
Carcinoma of the kidney—exploration	2	1
Cysts of the kidney—exploration	1	
Cysts of the kidney—Rovsing operation	2	
Cyst adenoma—enucleation	1	
Hematuria—nephrotomy	1	
Hydronephrosis and ureteral calculi—nepro—ureterectomy	1	
Hydronephrosis and hydro-urter—nephro-ureterectomy	2	
Hydronephrosis (intermittent)—Peck's operation	2	
Plastic operation and division of blood vessels	4	
Hypernephroma—exploration	3	
Inoperable malignancy, tuberculosis, both kidneys diseased—exploration	12	
Movable kidney—decortication and nephrorrhaphy	2	
Nephrolithiasis—nephrolithotomy and pelviolithotomy	86	2
Nephrectomy (partial)	6	
Edebohl's operation	2	1
Pyonephrosis and pyo-ureter—nephro-ureterectomy	5	
Acute suppression—decortication	4	2
Papillitis—nephrotomy	2	
Tuberculosis—nephro-ureterectomy	3	
Sinus dilatation and curettage	1	

Table 2

OPERATIONS ON THE KIDNEY IN 1918

	Cases
Nephrectomy	239
Tuberculosis of the kidney	81
Pyonephrosis (associated with nephrolithiasis, 34)	67
Hydronephrosis (associated nephrolithiasis, 6)	41
Hypernephroma	18
Carcinoma	3
Sarcoma	1

Pyolonephritis	9
Polycystic kidney	3
Nephrolithiasis with multiple cortical abscesses	2
Multiple cysts and abscesses	2
Remnant of kidney following operation elsewhere	2
Congenital cystic kidney	1
Retroperitoneal sarcoma adherent to kidney	1
Multiple abscesses of the kidney	1
Pyelitis	1
Infected atrophic kidney	1
Recurring stones with sand	1
Ruptured kidney—perinephritic abscess.	1
Branched stone with kidney—substance destroyed	1
Nephrolithiasis—chronic nephritis	1
Chronic infection	1

Surgical mortality.—Of the 239 patients on whom nephrectomy was done 7 (2.9 per cent) died. Three had tuberculosis of the kidney; one died of tuberculous broncho-pneumonia, one of miliary tuberculosis of the lungs and tuberculous peritonitis, and one of chronic nephritis and bilateral pleuritis. Two of the patients had pyonephrosis; one died of hemorrhage (forceps on pedicle) and one of thrombophlebitis of the inferior vena cava, the common, internal, and external iliac veins. One patient with hypernephroma died of an infection. This patient was operated on by the transperitoneal route. One patient with carcinoma of the kidney died of acute nephritis and metastatic carcinoma in the lungs.

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HYPERTENSION IN ITS CLINICAL ASPECTS*

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McCrea, in 1916, in reviewing Sir Clifford Allbutt's book on "Diseases of the Arteries, Including Angina Pectoris" said concerning hypertension: "It is not difficult for the majority of us to be beyond our depths before we know it when we venture in these waters." This is still true in certain phases of this subject, and our conceptions of some of the aspects of the hypertensive states are still more or less obscured. However, in the intensive work done in this decade its problems are becoming clarified by the correlated work of the clinician, the pathologist, and the experimental physiologist and chemist.

The points concerning which we are still in doubt evolve chiefly from our vague understanding of the various clinical entities from which hypertensive states arise, the sequence of pathological phenomena, the histological pathology of peripheral arterial changes, both visceral and somatic, and lastly, the toxic factors producing these changes, either by their action on the vasomotor center, on the vasomotor nerve distribution, or on the circulatory system itself. It is with this in mind that we have undertaken the study of this subject in its clinical aspects, in an endeavor to ascertain the incidence or non-incidence of hypertension in various conditions, relegating the experimental and more abstract scientific considerations to those better qualified by training and equipment to do so. No attempt will be made in this discussion to completely classify hypertension, and further, any attempts at classification at this time by anyone would probably be premature until we have a more definite knowledge of cause and effect, by which any classification must by necessity be governed. Clinically, there is a rather sharp demarcation between those cases characterized by a considerable systolic elevation, with a noticeable diastolic rise, as exemplified in the renal and benign hypertension cases particularly, and those in

*Read before the Minnesota State Medical Meeting, Oct. 1, 2, 3, 1919, Minneapolis, Minn.

which the systolie readings are not so markedly raised, with the diastolie normal or nearly so, as noted in the hypertension of hyperthyroidism, aortie insuffieieney, etc.

Our records of The Duluth Clinie, fairly well eross indexed, of the medical eases for the past three or four years, show a total of about three hundred cases in which there has been an elevation in the diastolie over 90, aeeompanied by a systolic elevation approximating 200 or above. In an attempt to elassify cases from these reeords numerous lapses were found and incomplete data, but an analysis soon showed that a very large pereentage of these highest pressures were elassified either as primary kidney or as the essential type, praetieally exeluding all other faetors, exeept merely as they arose eoineidentally. Realizing that the diagnosis of essential hypertension should be made entirely by exelusion and after the most intensive clinical study, it has been apparent that eonsiderable time should elapse before these cases are definitely plaeed in that category.

Therefore, from the totals of these cases it has seemed logieal to ehoose forty of the types definitely primary renal, or at least a mixed form, and forty more of those definitely in the essential group, and to study these partieularly in their symptomatology and differential diagnosis. In the same way, it seemed logieal and instruetive to consider eertain reeognized clinieal entities said to be associated with hypertension elinieally, in whieh we do not have sueh a variation in the diastolie pressure and in which the systolic pressure is only moderately elevated, in an effort to find out what our reeords show as to sueh an assoeiation. In this line we have eonsidered asthma, uterine fibroids, hyperthyroid and hyperpituitary diseases, diabetes, syphilis, arteriosclerosis, mitral and aortie insufficiency, and the records of these cases have been consulted.

In eonsidering the blood pressure elevations in these eonditions, partieularly those in whieh the change is only moderate and in the systolie pressure particularly, it must be borne in mind that the pressures are elevated physiologically, one might say, as the age increases. Due eonsideration must be extended to this alteration in interpreting the findings. Fisher's table of 28,000 normal eases, verified by Janeway with a far smaller number, shows the normal average to increase from 120 in early adult life to 135 mm. at the age of 60. Janeway, however, agrees with Cook and Lauder Brunton that 150 is the maximum normal limit in the deelining period of life, and Allbutt eonsiders 160 mm. as maximal, eoneurring in this with Wildts, who in his intensive study of blood pressures in the aged found that figure to be the maximal normal limit at the age of 60, with an elevation to 90 or very slightly above in the diastolic pressure. Another faetor to be eonsidered is the well known tendeney for first readings to be higher, due to nervous influenees, whieh also shows exemplifieation in the produetion of higher readings in people of a neurotie tendeney and at the menopause. A high reading should not be eonfusing in these eases as its variability is its best evidenee,as well as the absenee of left ventricular hypertrophy, a neeessary result of long eontinued high pressure.

In our series of high pressure eases we have noted almost without exception that all our cases have fallen into the group of nephropathie cases, or by exclusion have been plaeed in the elass of essential eases, synonymous with hyperpiesia of Allbutt or the primary hypertensive eardiovaseular disease of Janeway. Rarely we would note a case of intracranial pressure, although we found these cases exeeedingly variable in their readings, and also oeeasionally a ease of fibroid uterus or diabetes mellitus would be noted, but in both there were invariably renal changes evideneed, and if not, they might still be of the essential type primarily, although an exact differentiation of eourse eould not be made until we know of some positive signs of essential hypertension and not negative only. The incidence of these cases, however, was so rare that the above contention holds true, that p r a e t i e a l l y all eases of exeessive systolie and diastolic pressure belong either to the nephritie or the essential group. In this group of eighty eases we used only eases of high tension, as in our series lower pressures were usually aseribable to a eause other than essential. Yet, we realize, of course, that essential cases must have an intermediate eourse when the pressures are lower. These patients however, rarely present themselves for treat-

ment until hypertensive symptoms ensue, either cerebral or cardiac, the moderate degree of hypertension in the early stages even causing a feeling of euphoria, due probably to cerebral stimulation, as suggested by some observers. Our work being largely in ambulant cases, in which the more frank renal symptoms were not evident, the work of differentiation caused increased difficulty. Yet these cases have been observed for several years, and hospitalization and close observation were often resorted to for closer study. These eighty cases which we have studied were also not selected cases, but chosen at random, so they are fairly indicative of the average. The average age of our forty cases of essential hypertension was fifty-two and one-half, and of the renal cases forty-six. This is in accordance with the clinical observations of others, and is a refutation of those observers of a past generation who hold that these cases were pre-renal, as taught by Mahomed and others. The age incidence of essential hypertension is fully a decade later. Close observation of these cases for several years, and by other clinicians, all the way up to eighteen years, further shows the fact that these cases do not develop into nephritic types. The average systolic pressure was also in contrast, 216 mm. in the renal to 199 mm. in the benign and in the diastolic the figures were 127 in contrast to 111 mm. Only five, or twelve and one-half per cent of our benign cases, had a diastolic from 130 to 140, and only seven, or seventeen per cent a systolic over 240. In the renal case twenty-one, or fifty-three per cent, had a diastolic over 130, and fifteen, or thirty-seven and one-half per cent had a systolic over 240. Pressures over 240 systolic and 130 diastolic are very apt to be renal. The antecedent history is of great importance, and scarlet fever, diphtheria or eclampsia were frequently found to have occurred in the renal cases. Whether it is because typhoid fever has in the past been widely prevalent at the Head of the Lakes or not, fifteen per cent of our non-renal cases gave a history of typhoid previously. The percentage I am sure is higher than the typhoid morbidity. Most of the essential cases occurred in fleshy, ruddy faced individuals, and hearty eating and constipation were often noted. A great many, though, are not of this type of build. Constipation was also noted in our renal cases, but the gastric distress often found in our renal cases was conspicuously absent in the essential type. The ruddy appearance in contrast to the paler color of the renal cases, as well as Geisbock's observation in his cases of polycythemia hypertonica, in which he found a group of cases of polycythemia without splenomegaly, and with increased pressures, led us to make red blood counts of several of our cases, and these cases showed markedly higher counts than our renal cases. This had suggested itself to some of the English observers, but as far as I know has not been consistently done. We found this to be of considerable value in differentiation, as the average is about 1,000,000 red blood cells lower in the nephritic cases, due to anemia.

As far as the subjective symptoms are concerned, those of a cerebral type were particularly common in the benign cases. The major symptom, or presenting symptom, in nearly all of these cases, was one or more of the following: Headache, usually occipital in type, dizziness, faintness, tinnitus, sleeplessness, paresthesiae, and in four cases paralysis, due to cerebral accidents. Of these, headaches and dizziness were the most constant, and symptoms of a cerebral nature were noted forty-nine times in the essential cases, in contrast to only twenty in the renal cases. Precordial distress, in the way of pain, often anginoid in character, or extra systolies subjectively noted, were also rather constantly complained of in the essential cases, but not in the nephritic. On the other hand, gastric and respiratory symptoms were more common in the renal cases, noticed particularly as nausea, vomiting, indigestion, and in the respiratory tract as dyspnea and cough. In our renal cases these symptoms were noted twenty-eight times, whereas in the essential cases these symptoms were the cause of complaint in only two instances. More typical evidence of renal involvement, as edema and faulty vision, were not noted very frequently in this series, as these were often borderline cases. For the same reason, definite objective symptoms were usually absent in the nephritic cases also, as marked edema, albuminuric retinitis, or the presence of albumin and casts in the urine, because these were many

times cases that closely approximated each other in their physical findings. This is frequently the case in treating ambulant cases, with which we largely deal.

Renal functional tests, such as the Mosenthal test, Dr. Rowntree's phenolsulphonephthalein test, and tests for the nitrogen retention products, were oftentimes of considerable value. The findings, however, in the tests for non-proteid nitrogen retention were sometimes ambiguious in character and not of particular diagnostic value, although we do not doubt their value as far as prognosis is concerned in the more severe types of the nephritides. When we find 20 miligrams of urea in the blood, or slightly above that figure, it is difficult to say that this establishes the diagnosis of a renal factor, as figures even as high as 30 miligrams showed renal involvment in only two-thirds of the cases, according to Woods. The P. S. P. test we found of considerable value in conjunction with the use of the Mosenthal, which we have used rather extensively in these cases. In cases which subsequently proved to be nephritic beyond doubt, we have felt that the Mosenthal test, showed positive evidence when done in the earlier stages of these cases. Nocturnal polyuria is oftentimes noted in both types of cases, but more consistently in the renal ones, and the latter also show a tendency to increased amounts with low specific gravity and marked fixation. In the essential cases, the nocturnal polyuria is probably associated with the insomnia, of which a great many patients complain. Unless markedly characteristic, we do not place too great a value on any one of these tests individually, but rather consider each case in toto, and by careful estimation place it either into one group or the other. On the other hand, we have attached considerable confidence to a positive Mosenthal, because continued observation usually proves it to be true, especially if typical in its findings, which I believe it is, more uniformly in the nephritic cases, than tests for the non-protein nitrogen retention. The subsequent course of these cases after observation for several years enabled us to establish doubtful cases as belonging either to one group or the other.

In considering those cases accompanied by only a moderate systolic elevation, with practically no change in the diastolic pressure, we have used the table of Johnson and Lavis, who estimate that the age, plus 100, is the maximum normal systolic pressure for a given age. For example, 140 at the age of forty, 160 at the age of sixty and above.

The association of hypertension with disorders of the glands of internal secretion has often been commented upon. Uncomplicated derangements do not give rise to a very marked elevation, and affect only the systolic reading, so that the pulse pressure is elevated. In hyperthyroidism there is usually an elevation in the systolic pressure, in fact, so often that it can be accepted as a point in the differential diagnosis of neurocirculatory asthenia, in which the systolic pressure is usually a trifle below normal.

In thirty of our cases in which the blood pressure findings were recorded, we found the average systolic to be 136 and the average diastolic 83, with an age average of thirty-six years. Of these cases; fifty per cent showed a hypertensive feature, and sixty per cent an increased pulse pressure. The higher rate of metabolism, with the resulting tissue hunger, calls for increased output, or as Dr. Plummer puts it, "More work, higher blood pressure". In one particular case of dyspituitarism, a case of typical acromegalia, we found the blood pressures to be 160 and 90, with a pulse pressure of 70, an observation in accord with the usual conception of the condition.

On the assumption that at the menopause cessation of ovarian function and its hypotensive action no longer act as a check-rein on the pressor action of the thyroid, adrenal and pituitary bodies, Hopkins recently in the American Journal of Medical Sciences, sought to establish that non-renal high pressures of women in the fifth and sixth decade of life are due to this perversion instead of being of the benign or essential type, maintaining that non-renal hypertension of severe grade does not exist in the male, and that clinically there is no such entity as essential hypertension. This does not seem tenable for the reason that non-renal hypertension cases do exist in the male as well as in the female, though not as frequently. Neither do we have any perversion of endocrinous action in the other clincal states,

as hyperthyroidism and pituitary disease approaching the high pressure values of benign hypertension. Further, if such excessively high readings do occur at the climacteric, one would expect at least an appreciable elevation more uniformly in women at that age, which is certainly not the case according to observations on a large class of women in that period of life. The age incidence is probably merely coincidental, and the converse is more apt to be true, that leaving aside the neurotic element, high pressures in women at that period of life are more likely to be of the benign or renal type than otherwise.

In fibroid tumors of the uterus we have noted in twenty recorded cases an average systolic pressure of 146 mm. and diastolic of 92, with an age average of forty-six. Eight, or forty per cent of these cases, showed a hypertension for their ages, usually of moderate degree, but occasionally markedly elevated, as exemplified by two of our cases. In both of these cases renal factors were evident. Compression of the ureters and bladder may inject a renal factor into these cases, as the moderately high diastolic average would suggest, probably by causing a back pressure in the urinary tract. Surgical kidneys, however, as found with hydronephrosis, pyonephrosis and pyelitis, do not yield a uniformly high pressure, and are usually found to be of a great variability.

CO_2 in excess in the blood, either directly or indirectly, by its direct action on the medullary center or through the increased viscosity of the blood, with decreased velocity, is recognized as a cause of hypertension, and its degree varies with the extent of asphyxia, usually, being most marked in tracheal or laryngeal stenosis. Asthma, in which hypertension is said to be present, has not proved so in our series of cases, not any being elevated in fifteen. These recordings were taken in ambulant cases, fairly comfortable at the time. Except during the seizure the occurrence of hypertension in this condition is exceedingly doubtful.

The excess of CO_2 may be a factor in mitral insufficiency cases which show rather constant but moderate elevations. Twenty-five of our cases with an age average of 35, showed an average systolic pressure of 139, and average diastolic of 88, 52 per cent showing hypertension. An increase in pulse pressure was noticed with about the same frequency. The left ventricular hypertrophy per se does not cause any systolic variation because the output is not increased, the hypertrophy being incidental to the effort of the heart in maintaining a normal supply to the tissues. The question of a mechanical factor is not of as much significance in these cases as it is in those of aortic insufficiency. In this condition the left ventricular hypertrophy is probably at its greatest, and we note a usual elevation in the systolic pressure, due to the cardiac systole forcing the total output into the systemic circulation. In these cases, however, due to the low diastolic, the sphygmomanometer records only the apex of the impulse and we do not have the full rounded pressure head that we do in the other types of hypertension. In twenty-two observed cases the age average was 34, with an average systolic of 140, and an average diastolic of 62. The average pulse pressure was 76 (greater in this series than any other, and although only 59 per cent showed a systolic elevation, nevertheless 96 per cent showed an increased pulse pressure, a percentage not found in any other condition associated with hypertension. The apparent high pulse pressure in diabetes, lead poisoning, arteriosclerosis and in the renal and essential easas, is due to the wide disproportion in the elevation of systolic and diastolic existing in the essential and nephritic cases, and to the same alteration found physiologically in advancing years.

The common inclusion of diabetes among hypertensive states is not proper. It is true that high pressure is often present, but that diabetes per se is the cause is not based on sound reasoning, when we remember the frequent concurrence of renal lesions. Diabetes in the young is not accompanied by high blood pressure, and yet arterial changes occur very early. The toxic factor bringing these changes about is certainly not pressor in type. In hypertensive states it is not uncommon to have a hyperglycemia, and the renal threshold for sugar may be exceeded. This must be taken into consideration when we are dealing with a diabetic syndrome in hypertension cases of

any degree. It is also rather well known that in arteriosclerotic conditions later in life, sugar is not uncommon in the urine, probably due to sclerotic changes in the pancreas or elsewhere. The moderately high readings that we get in diabetes later in life in uncomplicated cases, we find are not beyond the normal variation for that age. Elliot denies the existence of hypertension in true diabetes mellitus as far as the diabetes is concerned, and so does Janeway. In our thirteen cases, with an age average of 52, the average systolic was 151, and the average diastolic 94. Thirty per cent showed a hypertension for the age, in every one of them, however, the occurrence of some complicating feature as before noted, was present. No case under the age of 40 showed hypertension. Lead poisoning, according to most authorities, causes arteriosclerosis, and is accompanied by high blood pressure in the earlier stages, through a hypermyotrophy of the vessels; later by renal complications. Gibson claims that whether renal disease is present or not, hypertension nevertheless exists. Of five cases observed by us, four showed renal complications and all showed hypertension.

Allbutt's classification of arteriosclerosis into the decrescent, hyperpietic and toxic types best serves our purpose for clinical study. It is his contention that unless complicating features are present, either hyperpiesia, or other factors associated with hypertension, as renal disease, we do not have blood pressure findings out of proportion to the normal in the decrescent type. It is unusual to find excessive pressures in the typical atheromatous changes of decrescent arteriosclerosis, as shown by the eye ground findings, by palpating the superficial vessels, or by x-raying the posterior tibial, and when high pressures do exist we nearly always find evidences of a combination form of nephropathy. In twenty recorded cases of this class, with an age average of 61 and average pressures of 153 and 90, we found only 20 per cent associated with hypertension. Some of these cases which do show high blood pressures are probably primarily of the essential type, although in our group we found that all were due to renal complications. Notwithstanding this concurrence, our cases show a low percentage of elevated pressures, when compared to the normal for that age.

The question as to whether syphilis or a toxic arteriosclerosis induced by syphilis is a cause of hypertension has often been discussed. There is a popular impression, however, that syphilis is a factor in the production of hypertension in itself. We have studied eighty-four of our cases of syphilis in various stages to see what our results would show. The cases encountered by the internist are usually of a different type from those encountered by the genito-urinary man or the syphilologist. Our cases are oftentimes grievously neglected as far as treatment is concerned, or the patients are totally unaware of its presence. They are the cases that are most favorable for the development or arterial changes, and if hypertension is common it should be noted in this particular type. Of these eighty-four cases, twenty-four showed definite hypertension, some involving the systolic only, and in others being general. There is no question that aortic insufficiency, due to a luetic infection, as well as intra-cranial lues, are oftentimes or usually attended with higher blood pressure elevations. Renal coincidences are not uncommon either. Of the twenty-four cases in which hypertension occurred, there were in half of these, or twelve, lesions, either in the cerebrospinal system, in the aortic valves, or in the kidneys. In one very instructive case which we had, we had a systolic pressure of 240 with a diastolic also somewhat over the normal. The patient had definite cerebral lues, and immediately upon the institution of vigorous antiluetic measures the blood pressure readings gradually but promptly subsided to normal values. This was the most striking illustration of the influence of cerebral lues on blood pressure findings. Also with our renal cases we noted a very marked elevation, but the renal involvement was no doubt purely coincidental.

In spite of these cases, there were about twelve cases, or fourteen per cent, in which we could find no demonstrable cause for the hypertension, so that we are inclined to believe that there are some cases of lues in which hypertension is present even though the percentage is small, in which we do not find any evidence of cerebral lues, nephritic involvement or aortic lesions. Just how these influences are brought about is diffi-

cult to say, but in our series of cases visceral complications were common and the control of normal peripheral tension may have been thrown out of balance in some way. Nevertheless, it shows that we have a small percentage of cases in lues, in which we cannot ascribe the hypertension to one of the three usual causes found in these luetic cases.

To summarize, I would like to call attention to the following points:

(1) The diagnosis between essential hypertension and renal hypertension is oftentimes very difficult, and this is particularly noted in the ambulant cases usually encountered in private practice. In these obscure cases of hypertension due to renal causes, in which there are no frank evidences of renal involvement, the diagnosis must oftentimes be made on a slender basis, but observation over a period of time will usually enable one to put these cases into one class or another.

(2) The factors of especial importance in designating a case as renal are the higher values in the pressure readings, the degree of anemia, the frequent occurrence of gastric and respiratory symptoms, and lastly, the positive evidence of one or more of the renal functional tests, as the Mosenthal, Dr. Rountree's tests, or the test for nitrogen retention products and more typical objective signs as albuminum retinitis, albuminuna and hyposthenuria.

(3) In analyzing the cases of modern hypertension we find its usual occurrence in hyperthyroidism and in pituitary disease, characterized also by increase in the pulse pressure. It is hard to say whether cases at the menopause are due to disorders of the glands of internal secretion or whether the time of occurrence is merely coincidental, and may be due to other causes. We are certain, however, that there is nothing uniform about the elevation of blood pressure in women at the menopause. In mitral and aortic insufficiency there is usually an increase in the blood pressure, and the increase in the pulse pressure of aortic insufficiency is strikingly demonstrated when these cases are studied. Asthma, in our experience, has not show any cases of hypertension. Diabetes per se is probably not a cause of hypertension, but merely due to complicating features. In lead poisoning we find a uniform elevation in our readings. In the decrescent type of arteriosclerosis, we, in a small percentage of cases, have an elevation of blood pressure, but renal complications are the rule. In lues, although there are certain features, as intracranial disease, aortic insufficiency and nephritis, which make for high pressures, yet there is a certain percentage of cases in which there is an elevation of blood pressure, moderate in degree, not ascribable to one of these lesions. We cannot say dogmatically what this is due to, but nevertheless, in lues we have certain cases which show a hypertension aside from the causes mentioned.

DISCUSSION

DR. J. P. SCHNEIDER, Minneapolis: Mr. Chairman, Members of the Society: I think this study might be said to represent a pretty good example of what Dr. Herrick said last night could be done. This is as you see, a purely clinical study, and I must say that if I were to judge from the number of conclusions and deductions here that the doctor had spent a great deal of time in analyzing these cases. It is a fascinating subject, as he said, particularly because we have an instrument by which these points can be arrived at with particular precision. We are interested, of course, in the hypertension cases; the nephritic with the high tension which is shown here is quite well distinguished. They will run twenty and twenty-five per cent of the cases. When we use every possible means to determine the cause in other cases, and find those which we think are due to some certain disease, we still have a residue of cases in which we cannot, with our best efforts discover a cause, and those are very inviting for study. We have endeavored to attack this problem, but as yet our work is limited along this line. We have said that so far as fundamental work has been done we know that there are certain products which have a constrictor action. Among the amino-acids we have tyrosin, and this can be further split up into tyramine, and tyramine has a distinct vaso-constrictor action. If we inject it into the ear vein of a rabbit we can note the constrictor action as it occurs. If we inject it intravenously it will produce a definite rise in the blood pressure. Insofar as we have gone we have found that the study will not be so simple as a single injection or a few injections of these substances, because apparently a constant effect must be arrived at. If we stop to think of these substances as being the cause it will mean their constant presence and a state of allergy to such a substance. In order to produce such a state we would have to continue the use of intravenous injections of certain substances. This leads us to the work done by Albertson, which means that we make it possible to discover the real cause. The protein may be derived from the real absorption of necrotic tissue such as in the cases of fibroid, and

also possibly from the further cleavage of amino-acids into amines in the intestinal tract.

I wish to congratulate Dr. Hirschboeck for his extensive study of this matter. No one who has not done such work can appreciate the amount of labor that is required.

DR. H. L. ULRICH, Minneapolis: Mr. Chairman, Gentlemen: I hardly think there is anything more to be said after the paper and Dr. Schneider's observations.

We have come to the point that every hypertension case if studied extensively enough can show some renal lesion. The question is whether the renal lesion is caused by hypertension, or whether the hypertension is caused by the renal lesion. That is where we are stuck, and anything that is of assistance in enlightening us on this subject is of value.

DR. E. L. TUOHY, Duluth: I would like to formally discuss this paper because it is of extreme interest to me for the following reasons: I followed the post mortem material in Vienna and left that work firmly convinced of the general proposition, as maintained there, that any case showing clinically a systolic tension of 180 or more, or a diastolic of over 100 represented chronic kidney disease; and so firmly was I convinced of that that I gave a paper before this Association of which that was the main thesis. An attempt was made to differentiate those cases of primary kidney disease from arteriosclerosis. You will realize why, because pathologically these cases admit of the most definite differentiation. Within a few months three physicians jumped on my neck and said "You are crazy; I have no primary kidney disease but my pressure is about that limit." By that time, too, we began to depart from the anatomical pathological basis of the cases to a pathological physiological basis, thereby getting away more or less from the structure framework idea to that of capacity, and if you will glance over hastily the new loose leaf Oxford publication which is being put out by Christian and Mackenzie, you will note that all these men refer again and again to the basic physiological principles and tend to diverge from the anatomical viewpoint.

We have an enormous number of people who show hypertension. It is a great problem. Some physicians will maintain that the public would be better off if we never had a blood pressure machine, because many people find out they have a hypertension and become greatly annoyed by it and imagine many things as due to the pressure; we cannot change the blood pressure and what we cannot change we might as well forget. However, a series of observers, of whom Janeway was an early pioneer, followed up these hypertension cases in their own patients and tried to find out what happened to them, and they were able to bring out a considerable gleam of hope. Men of wide experience, such as Billings of Chicago, all point to numerous instances where they have made grievous errors in consigning somebody to an early departure from this life, whereas as time went on they went on very nicely. Out of this the general practitioner soon came to a more or less chaotic state, because the literature on the subject led him to infer that whoever had hypertension had primary kidney disease. He got the impression that he needed a very expensive apparatus to make the diagnosis, and when you explained that the finding of albumin in the urine did not mean Bright's disease in every instance, you knocked a great prop from under him. When you told him you were including in this many things that had no connection with primary kidney disease you put him more or less at sea, and then when you test the blood for nitrogenous retention products and the other things you made it all the more confusing to him, although he usually maintained a dignified silence. Medicine has never made much progress through the use of extremely obscure methods. Fundamentally, what is clear to the writer he can make fairly clear to anybody else, and so I think we are in a position at present to give the man who gives his patient a reasonable examination and takes a reasonable history ways and means to find out what the true conditions are. So from this study of our cases,—and Dr. Schneider is correct, it did require an enormous amount of effort to go over this series of records,—we are able to draw some fairly definite conclusions.

First, hypertension is a fairly elusive thing, but to deny its existence is absurd, and to state that it is present only among women is equally absurd, as Riesman of Philadelphia as well as others maintain. Many men state that men with the hypertension given here will die ultimately of kidney disease, but that is wrong. You well know that a man with essential hypertension is said to be ten years older than the primary kidney case. Our cases do not show quite that, but we can say six to ten years. Severe symptoms can be said to occur reasonably soon and they do, hence the effect on the gastrointestinal tract and what not. On the supposition that these essential cases were primary kidney we took up the study of the blood and were disappointed, because you do not need a telescope to look at a horse across the street, and if you use it you will be confused. We cannot give too much credit to the P. S. P. test and even more to the Mosenthal test, which is only that taught to students for years and years, of studying the day and night urine and the Mosenthal test is only putting patients under proper observations, and examining the urine collected at definite intervals.

The next point is that a great many things are accused of being the cause of hypertension,—arteriosclerosis, various toxins and other things. A very fair way would be to go and find out and analyze as many cases as possible. And so the question is of interest. Many of us cannot do abstruse laboratory research but any of us can take careful histor-

ies and watch the patient and have him come back for observation.

DR. S. P. REES, Minneapolis: Mr. Chairman, Gentlemen: I am impelled to say just one thing. I believe that in these cases more than in any other kind of a case, that men in general practice at least, should above all other things get a correct idea of our patients. His build, his weight, his habits, his amount of physical and mental work, and all other things that go into his daily life. I cannot repeat any stronger than Dr. Tuohy has about the absurdity of reading a certain blood pressure and then, without any report of the kind of a patient you have and the life he has been living and what he has been doing in every way, making a prognosis condemning him, or beginning to treat him, and if you will faithfully consider all the things that make a demand on a man with a certain blood pressure, without going into the fine detail,—and I commend with all my heart such a study as this, and I commend with all my heart those men who go into the fine metabolic details,—but for the average man in practice dealing with these people, learn to know your case thoroughly in an intelligent way, and then if you can simplify his food, if you can increase his elimination, if you can lighten the work he does physically and mentally, if you can take away unusual exposure, if you can keep infection away from him, then you are doing him good, a great deal of good, but you are very often doing him a great deal of harm by taking alarm at a certain reading and telling a man that he has ten or fifteen points above a certain normal reading, and then giving him dope to lower that pressure. That makes him feel more uncomfortable and probably does him harm. The blood pressure is there because the man needs it under the conditions under which he is laboring, and unless you can change those conditions and take away the pathology, or remove the cause in some sure way you do no good by telling him about it. That blood pressure Nature put there to meet such a condition and I have seen cases year after year where medicines given to reduce that have certainly done no good, and most of them have done considerable harm. So it goes back to the old thing,—get acquainted with your patients, and treat them, even though it be simply, treat them intelligently.

DR. C. B. WRIGHT, Minneapolis: I have always had the idea of essential hypertension that there was no such a thing and that in every case you would find kidney involvement, until I ran across a patient two or three years ago, a man of 34, pressure 260 systolic, 90 diastolic. At no time was anything to be found except a few dead teeth and tonsils which never bothered him. I studied him carefully and Dr. White studied him, and Dr. Rowntree and Dr. Sippy. He had a spinal puncture, had his blood examined frequently, an X-ray taken of his skull, and his blood pressure continued to be increased. During the last year I examined him again and his pressure at that time was 240. Dr. Hamilton saw him at that time. There has never been anything found in this man at any time. He finally died of an acute streptococcic infection of his neck and we were never able to determine whether it was following influenza or not. The post mortem examination showed nothing but a mild arteriosclerosis, a moderate cardiac hypertrophy which probably was secondary to his hypertension. This was one of those cases where just what the cause is of course remains to be determined.

DR. C. EUGENE RIGGS, St. Paul: Mr. Chairman, Gentlemen: This has been an excellent paper, revealing a very large clinical experience, and the discussion has been remarkable for its sanity. For years I have been of the opinion that a high blood pressure possessed many elements as to its explanation that we have not yet arrived at. I see a great deal of high blood pressure in my neurological work. One lady had a pressure of 250, this was years ago, and I felt like our chairman did,—it was requiescat in pace, and said as much to her friends. I saw her a few weeks ago and she was in very good health. I was conversing recently with Dr. Anders of Philadelphia, and placed this high pressure before him. He said, "We find it in many cases in our work, and we cannot find any clinical symptoms, but the patients seem to live in a comfortable way." I said, what have we to do about it? And the doctor replied "I think we might put the blame on some of the ductless glands.

With the last speaker I have a great deal of sympathy. The patients should be taken into consideration. Gentlemen, I think it is the determination of the life cycle that has more to do with the life of the individual than anything else. Some of the worst arteries that I have seen have been arteries in which the blood pressure was not increased.

DR. M. N. LELAND, Minneapolis: Mr. Chairman, Gentlemen: I wish to emphasize the point concerning the psychology of your patients in telling them that they have a high blood pressure. If the patients comes a few times and we find his blood pressure to be above normal, it seems foolish to tell him about it and I think it is best to wait until some renal tests have been made. Then if the test shows trouble tell them they have a little kidney trouble and a little hypertension. I have had many cases who have been told by other physicians that they had high blood pressure who have worried much about the heart disease, but when told they had some kidney trouble it does not seem to worry them. Are we not doing more injury by telling them of the high blood pressure and telling them not to worry than by trying to correct their diet and to eat less meat? The essential hypertension may be more common than we suppose, but the principle thing is, I think, not to be in too much of a hurry to tell our patients that they have a hypertension. I think there is only one exception, however; a patient may come for an insurance examination who

has always been well and you find a high blood pressure. In such instances tell him the pressure is a little above normal and to consult his physician. I think it is impracticable, in all other instances, to tell patients that they have a high blood pressure.

DR. O. R. BRYANT, Minneapolis: Mr. Chairman: I would like to ask the essayist if he found any predominant causative factors in these cases of essential hypertension.

DR. F. J. HIRSCHBOECK, Duluth (closing): I am very highly gratified with the liberal discussion which this paper has elicited. I have nothing further to add, except to make a few remarks concerning one or two of the features brought out in the discussion.

Dr. Anders' statement that the glands of internal secretion would have an influence on this form of benign hypertension is often quoted, but the glands that would be most apt to be involved in this condition are probably the adrenals, and it has been shown that these are not a cause by the work of Fraenkel, O'Connor, etc. These cases of hypertension when due to the benign form, or when due to renal causes, terminate somewhat differently.

The cases of benign hypertension terminate almost invariably, either by cerebral accident or by cardiac defeat. The cause of death, when due to cerebral causes, is due to hemorrhage, and the termination is cataclysmic. In arteriosclerosis the cerebral symptoms are more slow in their development, as the cause is localized cerebral decay, analogous in the decrescent arteriosclerosis to the shrinking of the skin, the atrophy of the muscles, the fragility of the bones, etc.

The renal cases usually terminate from the end results of the renal pathology. Occasionally cardiac defeat is a factor, but cerebral accidents are rather rare. The reason for this may lie in the fact that the hypertension usually is of not as long duration and the arteries are still in probably good condition to withstand the continual buffeting. In answer to the Doctor's question regarding the cause, I must say that there is a singular paucity of etiological factors which can be reasonably demonstrated. Constipation is commonly noted in these cases, and may be a factor, and is well correlated with Dr. Schneider's observation as to the influence of tyramine on these cases of hypertension.

THE HANDLING AND TREATMENT OF DERMATOLOGIC AND LUETIC CASES IN THE DISPENSARY*

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The great significance of syphilis and venereal disease in relation to Public Health has been justly emphasized during the past two or three years, and inasmuch as Minnesota has been a leader in this, it would seem worth while to report briefly on the medical care and superivision of venereal patients at the University and by the State Board of Health.

It has been the policy of the Medical School to associate syphilis with skin diseases, particularly in regard to therapy. In 1916 due partly to the increased size of the clinic and partly to the determination of the staff to concentrate more on syphilis, one man was detailed to care for all luetic patients. At this same period arrangements were completed with other departments to refer all syphilities for treatment to this man. With this co-operation the men in the various specialties still have opportunity to see, demonstrate, and teach syphilis as it relates to their particular work, but the burden of routine treatment is removed and assumed by the department which is interested in the entire course of the disease. It was also at this time that the Social Service Department began work in this clinic and too much credit cannot be given it for its great service in investigating, following up and controlling patients. In thus rearranging and enlarging the scope of the department Minnesota was one of the first three or four schools in the country to give dispensary patients a really worth while service, and its students an opportunity to study, observe and treat large numbers of syphilitics in all stages of the disease.

There is a daily clinic. In 1915 the total number of visits was 4,992 with a daily average of 16. In 1916 a total of 6,909 and a daily

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average of 23. In 1917, 11,421 and a daily attendance of 37. In 1918, 14,538 and a daily average of 47. There are many days when the attendanee reaehes to 70 and 75 usually about two-thirds of these patients are luetics. The number of patients in the elinie eompares favorably with those of Chicago and the best Eastern sehools.

In 1917, Congress passed an amendment to the General Army Appropriation Bill, that is known as the Chamberlain-Kahn Bill. This appropriated money for publie health supervision of venereal diseases. As a part of this bill, $1,000,000 was allotted to the states on a population basis. Minnesota's allotment was approximately $23,000, 50% of whieh must be spent in the actual treatment of venereal disease. This fund is administered by the Division of Venereal Diseases, of the State Board of Health.

In eo-operation with different organizations several evening dispensaries have been opened. At the University, a men's dispensary is open two nights a week, the attendanee has run as high as 86 patients an evening. Students are given eredit for work in this elinie and it is in charge of University staff men, paid by the State Board of Health. In eo-operation with the Wilder Charities and United Charities in St. Paul, there are evening dispensaries for both men and women. In eo-operation with the Minneapolis City Health Department and City Hospital there is at the City Hospital in Minneapolis an evening dispensary for women. In Duluth an evening dispensary is supported by the State Board of Health and the loeal health department at St. Mary's Hospital for both men and women.

In all of these clinics the financial status of the patient is questioned, and an effort is made to prevent admittance of those able to pay for treatment. In this eonnection the point should be emphasized that many patients are admitted who could pay a little but eould not afford to pay for a sufficient amount of treatment to completely cure them. Patients who can, pay the actual cost of the drugs used, including arsphenamine. If unable to pay, arsphenamine supplied by the State Board of Health is used. The evening dispensaries were organized between Oetober and Deeember of 1918, and up to Sept. 1, 1919 have admitted about 1,216 patients, of these 573 were for syphilis, 264 males and 309 females, and 638 were for gonorrhoea, 487 males and 151 females. A total of 8,779 treatments have been given. While these clinics offer more material in syphilis and gonorrhoea, it should be emphasized that the University day elinie has a very good run of skin cases, the eommoner skin diseases are seen daily, and during the course of a few months many of the more rare diseases also appear. There are beds in the hospital for observation and treatment of dermatologieal patients when neeessary. A speeial laboratory for skin pathology is also available. The X-ray department is available for therapy. All of these clinies are open to the medical profession, and a eordial invitation is extended by both the University and the State Board of Health to all members of the Assoeiation desiring to see cases of this kind demonstrated.

Approximately the same treatment of syphilis is given in all of these clinies, the variation being in detail only. We realize of course, the individual needs, but patients may be classified aeeording to several stages of the disease.

The seheme of treatment of Syphilities admitted to the University Dispensary is determined by the stage or duration of the disease. Thus we reeognize:

1st. Early Primary Syphilis with the ehanere as the only symptom and a negative Wassermann test.

2nd. Early Syphilis with a chanere and glandular adenopathy and a positive Wassermann test.

3rd. Patients showing the secondary or tertiary stage of Syphilis.

4th. Congenital Syphilis.

5th. Early or late nerve involvement.

6th. Tabes and Paresis.

7th. Viseeral Syphilis.

It is the opinion of the staff physieians in the dermatological department that treatment with both arsenie and mercury affords the best results in curing or eontrolling any stage of the disease. It is also agreed, that frequent dosage with arsphenamine is essential to aceomplish sueeessful results. In all cases of early primary syphilis with a negative Wassermann test, an attempt to abort the diseases is

made. As a preliminary to this attempt a careful examination is made of the patients physical condition with special reference to the kidneys and cardiovascular system. If the chancre shows much induration and is favorably situated excision is recommended preceding the first intravenous treatment. Intravenous injections of 0.45 to 0.75 gm. neo-arsphenamine are made at intervals of three to seven days until ten or twelve doses are given, three courses of Mercury injections of six weeks duration are given and a second similar course of arsphenamine. It will be noted from this that not very much faith is placed in abortive cures and that the minimum amount of treatment suggested for even this early stage of the disease is nearly a year. The patient should be kept under observation one to two years for serological or clinical evidence of a recurrence. If the Wassermann test becomes positive or clinical manifestations of syphilis evident, the patient is treated as an established syphilitic. Absence of clinical symptoms, and a negative Wassermann test argue for a cure and a provocative arsphenamine injection may be given and the blood examined five to fifteen days later. A spinal fluid Wassermann test is also necessary at this time to determine a possible involvement of the nervous system.

Cases of primary syphilis with the chancre, general or partial adenopathy, and a positive Wassermann test have a generalized distribution of the spirochaetes, and are treated as secondary syphilis. In cases of established secondary syphilis or of the teriary stage of the disease three years treatment followed by one to two years observation is recommended. During the first year twelve to eighteen doses of arsphenamine are given in courses of four to six, at intervals of three days to a week. Between the courses of arsphenamine three courses of injections of mercury salicylate are given. These injections are given twice weekly. The first year's treatment should be energetic and the rest periods not too long, at first only one to two weeks, later in the year four to six weeks. The details of treatment are varied according to the patient's condition and the course of the disease as checked by serologic tests. We wish to state emphatically, however, that we do not believe less treatment than this should be given simply on account of favorable serologic findings.

If in the second year the Wassermann test remains positive or clinical symptoms of the disease are present a repetition of the first year's treatment is recommended. With absence of symptoms and a negative Wassermann test in the second year two courses each of arsphenamine and mercury are given. All showing symptoms or positive blood findings during the second year are given a two course treatment during the third year. All who have taken the required first and second year treatment with an absence of clinical syphilis, and a persistently negative Wassermann test are considered as cured, and return to the clinic at intervals for observation only. At the conclusion of the specified treatment aimed at obtaining a cure a spinal fluid examination is suggested to determine the presence or absence of central involvement.

The treatment of hereditary syphilis is longer, and more individualized than in acquired syphilis. The arsphenamine and mercury treatment is used as in the acquired cases, but the arsenic dosage is necessarily smaller 0.2 to 0.4 gm. being used. The mercury salicylate intramuscular injections or internal medication is not considered practicable in these cases and mercurial inunctions are used almost exclusively. It may be stated, that the well-known complications of Keratites and Irites are more amenable to treatment since the advent of Salvarsan therapy. The amount of treatment necessary varies greatly, and many are persistently Wassermann positive in spite of a prolonged and even intensive treatment.

Early or late nerve involvement, syphilis of the special sense organs, tabes, paresis, and visceral syphilis, present so many varied aspects, that no hard and fast rules can govern their treatment. Such patients are considered and treated individually with the recommendation of the various dispensary department heads from whom they are referred. It may be briefly stated that most of these patients require intensive treatment over a long period of time.

In conclusion we wish to emphasize again the large amount of material available in our own state and in fact, right at the doors of the members of this Association. Either through a lack

of knowledge of the opportunity or a lack of interest very few physicians are making use of these clinics, although the many patients coming to our attention would indicate the need.

In the treatment of syphilis, the diagnosis and energetic treatment in the early stage should be emphasized,—the proper interpretation of the Wassermann test should not be forgotten, the need of both arsphenamine and mercury in large amount for the established case is imperative. Mercury should be rubbed or injected; internal medication with mercury or potassiumiodide serves only to ameliorate symptoms; it has no place in the modern therapy of lues. There is at this time a need for the profession to recognize the social and public health phases of the problems in connection with this disease and we believe the profession will do well to meet this demand more than half way.

DISCUSSION

DR. HENRY E. MICHELSON, Minneapolis; Mr. Chairman, Gentlemen: I agree heartily with everything that Dr. Butler has said in his paper. In the Dermatological Department the most important thing is opportunity for diagnosis. No treatment should be attempted until a diagnosis is made.

In the treatment of lues we all have our own ideas as to what constitutes an adequate course of treatment, and what is inadequate. I am particularly in favor of the broken courses; adequate treatment with rest in between. The individual should always be considered. Too much treatment should not be given and the excretory apparatus should not be injured. The rest treatment should not be longer than three months.

It is interesting to see the different patients that are brought in for treatment. They should be sent to the proper specialist, the eye cases being observed by the ophthalmologist, etc., after the diagnosis is made.

DR. N. L. LINNEMANN, Duluth: Mr. Chairman, Gentlemen: Having had to deal with syphilis in all its forms, on account of being associated with an internist, it may be not amiss to say a few words. The syphilitic must be treated as an individual, and unless we do that we get nowhere. Neither can we give internal treatment alone and cure our patients today. We have to do more than that and salvarsan has been a great help to us. It is our custom to give salvarsan much as Dr. Butler has described, but we give it at longer intervals. We usually give from five to eight doses of salvarsan; at the same time giving mercury in between the salvarsan injections until we have given six to eight weeks of treatment and then rest for a month or so. Of course, in hereditary syphilis and in tabes one cannot give the large doses one can in cases of primary or secondary syphilis. The treatment is much as we were taught to give it in the army. In the camp where I was we gave salvarsan every five days and gave two injections of salicylate of mercury in the same interval and at the end of eight weeks stopped all treatment for six weeks. All the camps did not follow this plan but I think it is a very good schedule for treatment.

As far as following up the patients is concerned, it has been a great help to the University to have a Social Service Department. I think people are beginning to realize that they must have more treatment than has ordinarly been given, must be followed up and the doctor must tell them that they must come for a long period. This should be done at the patient's first visit and if done then. I believe the average person will do so. I think that not doing this at the beginning has hampered us. After treatment in the Army the patients come back for Wassermann tests and they are willing and anxious to get well. In this respect I think the Army has done a great service. With female patients we meet a different attitude. Within the last month I have had two patients to whom the necessity of prolonged treatment was explained and to each was given a course of treatment and neither returned. They have undoubtedly left town. What to do in such instances is a problem? It is a matter of education I think, the same as with the men. One thing to remember is treatment and then more treatment and not to let up at all till sure that cure is effected.

DR. E. Z. SHAPIRO, Duluth: Mr. Chairman, Ladies and Gentlemen: I do not wish to say much, for Dr. Butler has covered the subject very well. We have had about the same experience in regard to many of our patients and the treatment that Dr. Butler has had. I wish to emphasize the point about women patients I think the women are more responsible for the spread of gonorrhea and syphilis then men. This is true in private practice and also in the dispensary. A waitress recently came in with sore throat. We did a dark field examination and found the spirochete and the patient came in for two injections and then we lost track of her. We have put the social worker on her trail but cannot find her. That girl is a great menace as a carrier of syphilis. About a week afterwards a girl came in with mucous patches on the vulva and we had the same experience with her. She took two doses of salvarsan and three of mercury and then went away and we do not know where she is. As a rule, men will follow up their treatment. The women will not. I believe we will have to have better legislation in regard to confining them to the workhouse. I think the medical profession ought to get together with the legislature and have a rule whereby public women can be confined until their treatment is finished.

DR. L. G. ROWNTREE, Minneapolis: Mr. Chair-

man: I cannot allow this opportunity to pass without saying a word of appreciation in regard to the work Dr. Butler and Dr. Irvine have done in the treatment of syphilis. Before I arrived at the University I knew about their plans and since I have been here I have been very busy in backing up their plans. I think they have a very broad conception and I do not think it is possible to attack the problem from a broader point of view, and yet with more industry than they have. My relationship with this group has been very satisfactory. No one has ever been more willing to work or more anxious to look for work, or gave more attention to carrying on the work than they and I wish to express my profound appreciation at this time. In the treatment of the syphilis the problems involving the medical and sociological side has become increasingly difficult. We do want one thing, and that is control of the patient. Patients with hypertension, or with chronic arterial degeneration, or chronic heart disease, things that are not particularly disagreeable, they are likely to disregard. They will take care of the broken arm, or typhoid fever for six weeks with the distinct understanding that they will be out at the end of that time. But when you talk to a patient of treating him for five years, that is beyond his comprehension. Statistics have shown that regardless of experience the patients will only consult clinics for a certain number of times and then be lost sight of. Will we by reporting syphilis and by various methods drive people away? These are live problems. The fact remains that syphilis is a reportable disease and Dr. Irvine has tried his best to make this known to all of you physicians. You do not have to report by name but by number and nobody knows who the patient is.

DR. C. EUGENE RIGGS, St. Paul: Mr. Chairman: There are a few things that I would like to know and that I have not heard mentioned in this report. I would like to know what percentage of these cases in the clinic are neuro-syphilitic, what form of treatment was followed and what were the results of the treatment. Also, what about intraspinal medication and intraventricular medication. These are all vital and important things, especially to the neurologist.

DR. S. E. SWEITZER, Minneapolis: Mr. Chairman, Gentlemen: The object of this paper is twofold. In the first place we wish to give information as to the size of the clinic and also that it is not being utilized to any great extent by the physicians of the state, and I wish to extend an invitation to all of you to come and see what we have and what we are doing. The second object is to call attention to the lack of treatment that the syphilitic patient who comes to the clinic has had from his previous physician. The men who are specializing are doing the work properly, but in spite of all that has been said or written, the patient is rather undertreated than over-treated. Some of the things in Dr. Butler's paper were put in at my own suggestion. The Army treatment is being worked out by Dr. Butler and we shall work out a plan of giving mercury and salvarsan together and work out a plan also of giving the salvarsan alone and then the mercury. Personally, I have been giving them separately, the idea being that I never have cared much for polytherapy. If you are liable to get a nephritis from one of these preparations you are more likely to get it if you give them together, and then you do not know which causes it.

In the treatment we should be a little more careful not to irritate the kidneys.

In regard to the rest Dr. Linneman mentions, a rest period of six weeks or two months is all right late in the treatment of the disease, but according to my ideas not in the early course of the disease. In the early stage of the disease a positive Wassermann reaction will be turned to a negative and if you will let the patient alone a number of weeks it will turn back to a positive reaction. The purpose of treatment is to keep the patient's Wassermann test negative, and I am doing this during the first year by giving him a short rest period at intervals and at the end of the year giving a month and possibly at the end of the second year two months, and then continuing the treatment.

I wish to emphasize also the necessity for early diagnosis. It has been talked about and written about for several years, ever since the discovery of the spirocheta, but there are still men who wait until the disease is dissemminated, and opportunity for early cure is gone. An early diagnosis can be made by anyone who has a microscope and will look for the spirochetae. Also, if the patient is not immediately treated they are liable to spread the disease. Within twenty-four hours of it onset one can find the spirocheta in the initial lesion.

Another thing to call attention to is that a negative Wassermann reaction does not mean that the patient is cured. Many think that if the reaction is negative, as is desirable, the patient does not need further treatment. In the therapy outlined by Dr. Butler, he has emphasized the necessity of treatment for three years and secondary treatment for at least three years more. In regard to women patients, we lost more before social service aid went into effect than we do now. I do not think we now have any more trouble with the women than the men; some days we have regular ladies' clinics. I do not know whether they would attend if we did not have the social service worker, but we do not have to write many letters any more. They seem to stand by us as well as the men.

In regard to the treatment of neuro-syphilis, we are in rather an advisory position. I do not have charge of the patients in the hospital. Many of the patients are sent to the hospital and then go over to the Neurological service, and Dr. Hamilton has charge of them. At the clinic we have given only the intravenous treatment; the intraspinous treatment has to be given in the hospital. We have taken

the tabetics and given them intravenous treatment and if they do not improve they are sent to the hospital to have treatment continued there. The figures concerning these cases may be obtained from the Department of Neurology.

SOME APPLICATIONS OF THE PRINCIPLE OF FOCAL INFECTION WITH A METHOD FOR THE REMOVAL OF EXTENSIVE DISEASE OF THE ALVEOLAR PROCESSES*

By A. D. Dunn, M. D.
W. L. Shearer, D. D. S., M. D.
Omaha, Neb.

The principle of foeal infeetion has been established by the laboratory and aeeepted as a clinical factor in the etiology of aeute and ehronie rheumatism, eholeeystitis, ulcer, eertain aeute and ehronie nephritides, panereatitis, pleurisy, and some neuritides (Billings[1] and his co-workers, notably E. C. Rosenow.) We thought that some eomment on the applieation of this same prineiple to eertain other eommon clinieal problems might be of interest. Patients suffering from sueh morbid eomplexes, as neurasthenia ("fag", "laek of pep", ete.), toxie psyehoses, hypertension and vertigo, have generally proven unsatisfaetory to treat. The etiology given for these conditions is diffuse, vague and laeks therapeutie workability. We have carried out some elinical experiments on a number of eases of obseure etiology. We wish to sketch a few of these elinieal experiments and eomment on their interpretation, to diseuss certain prineiples that seem to us essential in the elinieal applieation of the foeal infection theory, and to present a surgieal technique applieable to extensive infection of the alveolar proeesses.

THE NEURASTHENIA-FAG TYPE. (CASES 1 AND 2.)

Case 1. Dr. X. suffered from a neuritis of the right musculo-eutaneous nerve of the leg which had bothered him off and on for several years, from fag, insomnia, and mental depression. His weakness and depression had beeome so severe that he was unable to work and had resorted to ½ to 1 grain of morphine daily to combat his feeling of utter hopelessness.

A eomplete examination, including Wassermann, revealed nothing but a poorly nourished, worn out man with a neuritis of the right museulo-eutaneous nerve, and an extensive infeetion of both alveolar proeesses.

The morphine was taken away gradually and the patient put on a hospital regime for ten days without material improvement. The mouth pathology was then removed by the operation to be deseribed later. In six weeks he had gained twenty pounds in weight, had largely lost his neuritis, and stated that he felt better than he had in years.

Comment. This ease shows foeal infeetion as a faetor in produeing neuritis, physieal ineapaeity and mental depression bordering on a psyehosis. In our reeords is a case of toxie psyehosis with hallueinations, that had been under a hospital regime for eight weeks without improvement. The mental eondition began to elear almost immediately after the removal of an extensive bueeal infeetion.

Case 2. W. C., aged 38, eomplained of weakness, fag, inability to work, abdominal diseomfort with gas, shortness of breath, and palpitation. He stated that he suffered from "drawing sensations all over the body", nervousness and sleeplessness, and that he had reeently spent five weeks in a sanitarium without benefit.

Physical examination revealed nothing of importanee exeept tonsils from whieh easeous material eould be expressed, and three teeth with small dento alveolar abseesses. He was of the eunuehoid type. The blood eount was 5,100,000 reds, and 6,000 whites and the hemoglobin 87%. The Wassermann test was negative. An examination of the stomaeh eontents, stool, and urine revealed nothing abnormal. Roentgenologieal examinations of the chest and gastro-intestinal traet were negative.

The mouth pathology was removed on the seventh day in the hospital, the tonsils on the nineteenth. No improvement had taken place up to the time of the tonsilleetomy, following whieh improvement was rapid with a gain of twelve pounds in weight in four weeks. The patient reported at the end of two years that he felt good, and that he had needed no other treatment, although his strength was not all that could be desired.

*Read before the Southern Minnesota Medical Association at Mankato, Dec. 1, 1919.

Comment. The presumptive diagnosis in this case was neurasthenia. The patient was quite typical of this class, both in appearance (Stiller type), and in the indefiniteness of his complaints. Removal of foci of infection enabled this man to work and to enjoy reasonably good health. It has seemed to us that the conception of the excess load might be justly applied to focal infections in neurasthenics. The constitutionally and temperamentally deficient have a much harder struggle with their environment than the physically and mentally fit. Add to their fixed handicap the extra load of a focus of infection and the scale is more apt to turn against them. The removal of the extra load and the concentration on their environmental problems of energy previously dissipated in combating removable infection, may determine success as against failure in life. The neurotic is a problem that will not down and any means that will help him to compensate his neurosis is worth while. We have records of several "decompensated" neurotics who were very materially assisted by the removal of buccal and tonsillar infections.

HYPERTENSION-CHRONIC INTERSTITIAL NEPHRITIS

(CASE 3.)

Case 3. J. H. S., aged 45, complained of swelling of both limbs, polyuria, shortness of breath, and fatigue.

The points noted on examination were a moderate cardiac enlargement, a markedly accentuated aortic second sound, systolic blood pressure of 184, diastolic 80. There was edema of both feet. The urine had a specific gravity of 1015, contained 2 pro mille albumin, and no sugar. Hyalin casts, some kidney debris, and blood cells were present. The tonsils were enlarged and contained pus. The teeth showed numerous dento alveolar abscesses.

The patient's condition began to improve immediately on removal of the infections. Two months later the urine still showed evidence of nephritis but the blood pressure was normal. Two and one-half years later the urine was normal, the blood pressure was normal, the heart sounds were normal and the patient was doing unusually hard farm work.

Comment. The high blood pressure, the polyuria, the cardiac signs, and the urinary findings, all fitted into the picture of chronic interstitial nephritis. Complete recovery from this syndrome which is not usually seen under common methods of treatment, is of interest. We do not maintain that the focal infections were the sole cause of the trouble but the sharp change in the patient's condition and the end result following the removal of these infections, supports the contention that they were a factor of some importance. The return to, and continuance of a normal blood pressure is noteworthy, for hypertension as a symptom is much more fundamental than albumin and casts. From our experience, infections have seemed to be *one of the tangible factors entering into the production of hypertension.* We have seen appreciable drops in blood pressure and improvement in symptoms follow the removal of focal infections, when the results of previous dietetic and hygienic treatment had been little satisfactory. In hypertension cases where the heart was flagging under the load of a high blood pressure, the removal of infected tonsils or extensive alveolar disease has apparently assisted in stabilizing the circulation.

VERTIGO (CASE 4.)

Case 4. Mrs. R. R., age 49, complained of dizziness and weakness. The dizziness had been so severe that she had sat up very little in the previous eight months and had needed help, when attempting to walk. She had been badly constipated and her appetite had been poor.

The patient was a poorly nourished, middle aged woman. The tonsils were buried and septic. The left tonsil had an injected anterior pillar and was edematous. The submaxillary lymph glands were enlarged. The heart and lungs were normal; the abdomen was flabby, and diffusely tender in the right hypo-gastric region. The cecum was distended. The deep and superficial reflexes and sensations were normal. There was no nystagmus, and there were no auditory symptoms. The pelvis was normal. The blood showed 80% hemoglobin, 4,300,000 reds, 14,000 leukocytes, with 74% polynuclears. The Wassermann test was negative. A test meal showed a total acidity of 47, free HCl 25, and combined HCl 11. The stool examination was negative.

Films of the teeth showed extensive disease of both alveolar processes.

A roentgenological examination of the gastro intestinal tract revealed nothing of importance except a somewhat tender retrocecal appendix and delayed colon motility.

The patient was subjected to a hospital anti-constipation regime. At the end of 10 days the colon function was normal but without appreciable improvement in the dizziness. Alveolectomy was then performed with complete removal of the mouth pathology. No improvement resulted. Two weeks later, the tonsils were removed. Within a week the dizziness had largely disappeared. Three weeks later the patient was discharged from the hospital with complete recovery from the vertigo. The leukocyte count had dropped from 14,000 to 6,500.

This clinical experiment would seem reasonably well controlled and conclusive as far as such an experiment can go. No suggestions were given to the patient. The procedures were merely carried out. The reaction of the vertigo to the tonsillectomy was sharp. We have records of five cases of severe vertigo, in which the results of the experiment (tonsillectomy) have been just as brilliant. In one case, removal of mouth pathology was followed by cessation of vertigo. A Meniere's syndrome was very much improved, both in severity and in frequency of attacks, by removal of extensive mouth disease. Failures, when successes might be anticipated, will occur from incorrect analyses of the etiology and from permanent changes having already taken place in the vestibular apparatus. One case of failure which illustrates this point, had in addition to badly infected tonsils, a syphilitic aortitis and hypertension (systolic blood pressure 210). All possible causes of vertigo should be canvassed before essaying the focal infection experiment. Obviously, cases of vertigo in otosclerosis, hypertension, arterio-sclerosis, severe secondary or primary anemias, intracranial diseases, etc., are not promising material. Shambaugh[2] has written on primary disease of the labyrinth as the result of focal infection. He logically inferred a neuritis of the vestibular nerve from tonsil infection because of the known predilection of focal infection for single nerves. In the absence of experimental work with organisms grown from the tonsils, or of autopsy investigations which would naturally be a remote and difficult possibility, all conclusions in regard to the pathology of the condition must be speculative.

Extensive removal of teeth for focal infection has recently been justly criticized by Alvarez (3) but his criticism fails, if cases receive the detailed study and thought which is their due. Teeth and tonsils must occasionally be sacrificed to no purpose, but if the indications are weighed with the same care that is wont to be given to laparotomies, the number of bootless removals will be limited. In the study of these cases, two fundamental reasons for the removal of a focus should be kept in mind: (1) the closing of a door of entrance into the circulation for infecting micro-organisms and their toxins, and (2) the removal of a useless load which the system is compelled to carry. The load factor has not been sufficiently stressed. The energy required to keep an infection under control, destroy toxins and repair damage must be subtracted from the sum total of disposable energy. Therefore, the focus must be considered, not as the sole cause of disease, but as one factor or one condition participating in the production of that "peculiar abnormal course of the same processes which make up the life phenomena of healthy individuals" (Cohnheim's definition of disease). It might be well to adopt a dynamic viewpoint in studying disease and to conceive of certain disease as resultants of several forces. It is a condition comparable to the dynamics of chemical reactions involving several substances. One views disease too often from a fixed point, one assumes a single etiology and a single explanation for what may be the result of several forces. If pathology is the result of an effort at adaptation to unfavorable internal or external conditions, there can be no reason why the system may not be adapting itself to several different conditions or forces at the same time. In other words, what we designate as a disease may be *the resultant of the effort at adaptation, not to a single but to several forces.* Typhoid fever illustrates the former group and the morbid states associated with senescence, the latter. It is quite apparent that efforts at adaptation

to noxious agents, no matter how trivial, demand energy. It is the consciousness of this dissipation of energy that often brings the patient to the doctor complaining of pain or of impaired functioning of the organism as a whole or in part. In our opinion, the existence of foci of infection may be passed over when the patient's life phenomena are normal, when he feels well, and when his energy is at par, but when energy is lacking and his life processes run wrong, in the absence of a tangible, workable etiology, we should advise the removal of foci of infection if for no other reason than that the patient be given the advantage of a lighter load. The extra load of a focal infection should not be underestimated, even in combating disease of known etiology. We have repeatedly been impressed by the acceleration of antiluetic cures by removal of the additional load put on the patient by foci of infection.

Deductions from clinical experiments are notoriously fallacious. Several methods of therapy are usually applied simultaneously and sufficient credit is not allotted to rest, change of scene, and better hygiene. In our efforts to determine the value of the removal of infections as a therapeutic procedure we have endeavored to stabilize environmental and other therapeutic conditions before attacking the focus. We have tried to determine the norm of the patient under the conditions of the experiment before the experiment was carried out. The patients have nearly always been subjected for a time to a fixed hospital regime before operation. The technique of the clinical experiment is another variable that must be accurately controlled. For a satisfactory experiment, the technique must be adequate. The technique of tonsillectomy has been perfected. Those of nasal and buccal infections are yet deficient. We wish to present as a corollary to this paper, a technique that satisfies the demands of a satisfactory experiment for the removal of alveolar infection. This technique of external alveolectomy was applied by one of us 14 years ago to the superior maxilla for cosmetic purposes, because it facilitated the fitting of pleasing dentures in cases where the upper jaw was unduly prominent. In attempts at removal of infection with a curette, we were impressed with the uncertainty of the "working in the dark" and with the prolonged suppuration and retarded healing of the curetted sockets. Removal of the external alveolar plate after thorough curettement convinced us of the improbability of complete removal of extensive infections by the curette. Therefore, the operation of alveolectomy was applied as a routine procedure in extensive infections of the alveolar processes. The teeth are removed, the mucoperiosteum is dissected up to the root ends of the teeth, the external alveolar plate is taken off, then the diseased tissue is attended to under the eye, the bone smoothed down, and the lingual and buccal gingival mucosae trimmed and sutured with horse hair. Healing, much to our surprise, has been almost entirely by primary union, febrile reactions have been practically eliminated, and the greater comfort of the patients following this procedure has been almost unbelievable. Furthermore, the technique permits of the clearing up of an entire alveolar process at one sitting without fear of post operative reaction.

Conclusions:

1. The principle of focal infection is usable in the treatment of neurasthenia, fag, hypertension and vertigo.

2. Alveolectomy is the operation of choice for removal of extensive disease of the alveolar processes. The technique is adaptable to partial removals.*

*Lantern slides illustrating the details of the technique of alveolectomy were shown by Dr. W. L. Shearer.

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DISCUSSION

DR. WILLIAM L. SHEARER, Omaha, Neb.: It is not my intention, in any manner, to discuss many of the problems as presented by Dr. Dunn in this paper, as my work is a component part of the paper,

and so, in reality, I should not have been on the program to discuss the paper, but to present lantern slides and cover the surgical technic for the certain eradication of disease as far as possible.

When brought face to face with the difficulties incident to the removal of mouth pathology, having no surgical technic of a standardized nature to successfully rid the mouth of these infections, I set to work to design operations which would accomplish this end.

In 1905, as has been described by the essayist, I designed an operation known as the External Alveolectomy. In the last few years we have found this operation most valuable when combating extensive infection of the jaws. I have endeavored, insofar as possible, to standardize this technic in order that we might eradicate disease.

A granuloma in the body of the alveolar process or jaw, may be analagous to any granulation tissue in any infected bone cavity and elsewhere. In this operation the disease is removed under the eye as has been described and a collapse of the bone cavity is practically accomplished. The lantern slides should, in themselves, be illustrative of the steps employed to accomplish this work.

I can not refrain from expressing my appreciation of certain remarks made by Dr. Rosenau, insofar as they speak for the so long desired and surely necessary co-operation in this work.

DR. EDWARD C. ROSENOW, Rochester: The Southern Minnesota Medical Association is to be congratulated to have brought before it such carefully controlled clinical experiments. The idea of considering focal infections as a load on the health of the individual as considered by Dr. Dunn is quite new or at least as not been sufficiently emphasized heretofore. Some of the experimental results which I have had indicate that a direct causal relationship might exist between foci of infection and systematic disease in conditions in which no outspoken lesions have been found. Thus in a series of cases of intercostal neuralgia, intravenous injection of bacteria isolated from foci was followed by the occurrence of lesions in the posterior roots, and in patients suffering from myalgia and nerve pains in various parts of the body the bacteria from foci localized and produced lesions in peripheral nerves and muscles adjacent to nerve filaments.

The splendid results which Dr. Dunn and Shearer have achieved through painstaking, skilled effort in determining the probable focus and its complete removal indicate, first, that a simple extraction or extraction with curettement of infected teeth is not sufficient to surely eradicate alveolar foci of infection, and second, that exacerbations of systematic conditions noted so commonly following extraction and curettement, while indicating causal relationship, mean at least in many instances the stirring up of, and not the removal of the infection, and third, that the lack of improvement following the extraction of teeth may be due to the fact that the infected area did not heal even though the tooth had been removed, or that these foci were not responsible for the condition.

DR. DUNN (closing the discussion): I wish to add just a word in regard to systemic reactions following the removal of extensive mouth pathology by the method described by Dr. Shearer. Since we have used this methtod, we have ceased to worry about exacerbations of temperature, collapse, rapid heart action and the other manifestations of acute toxemia or hematogenous infection. Alarming symptoms have been uniformly absent. Of course, patients will occasionally have exacerbations of joint manifestations and of pains in the muscles and bones, but not to the degree that we were accustomed to see under the old methods even when only one or two teeth were removed at a time.

THE TREATMENT OF TUBERCULOSIS OF THE SPINE*

By H. W. Meyerding, M. D., F. A. C. S.
Section on Orthopaedic Surgery, Mayo Clinic
Rochester, Minn.

Early diagnosis and careful prolonged care of the patient under competent supervision are essential in order to obtain favorable results when tuberculosis attacks the spine. Although conservative treatment has given a fair percentage of favorable results, a definite group remains in which the surgical fusions of Hibbs and Albee have shortened the period of disability, prevented further deformity, and given more certain relief than conservative measures, thus placing these operations on a sound surgical foundation in the armamentarium of treatment.

The fact that the spinous processes and laminae are seldom involved in tuberculous spondylitis makes the fusion operations practical. It is to be remembered, however, that the disease process is merely immobilized by such surgery and the deformity remains, that the patient is tuberculous, and that a focus in another part of the body probably exists. Nature is slow in producing ankylosis, and external splinting to immobilize completely is impossible; surgery, on the other hand, gives the best fixation in a comparatively short time.

Hibbs has reported (1916-1918) excellent re-

*Presented before the Minnesota State Medical Association, October, 1919, Minneapolis.

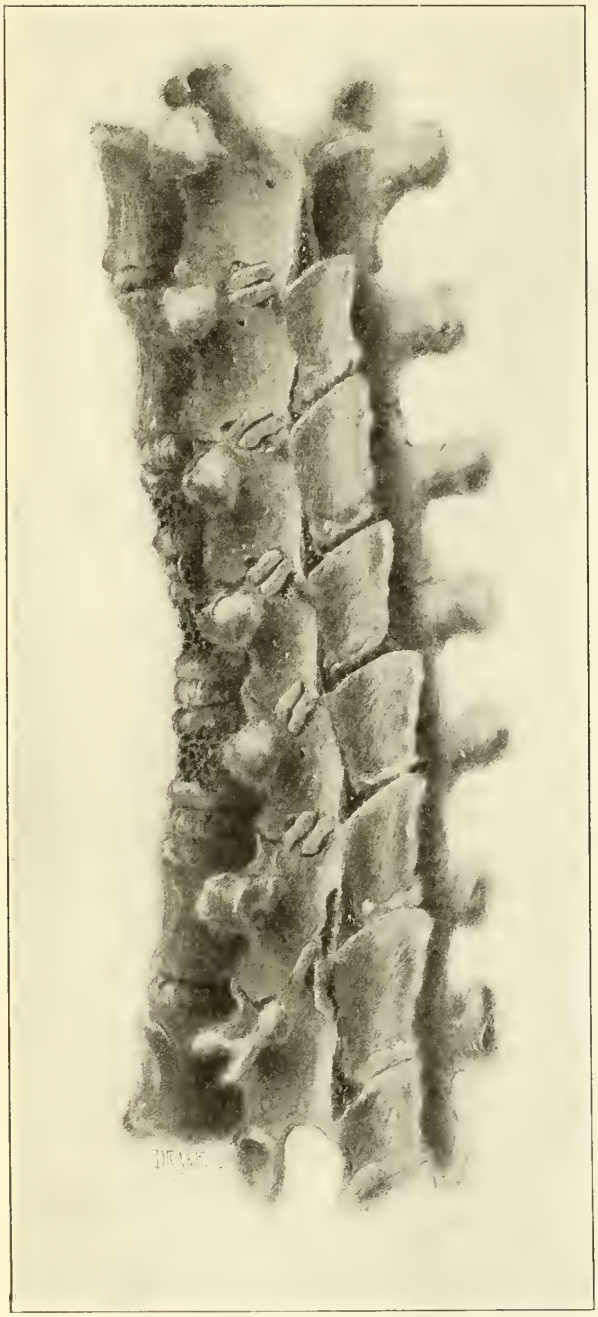

Fig. 1. Hibbs operation. Fractured spinous process and spiculae of bone bridging freshened edges of laminae.

sults from his subperiosteal fusion. He believes that all patients who will take anesthesia should be operated on. He constructs a periosteal tube filled with the fractured spinous processes and the freshened ends of the laminae from which spiculae of bone are chiseled and bridged; he has practically always produced fusion (Fig. 1).

Albee credits his bone grafting operation, which consists of removing a long section of bone, preferably from the tibia, and placing it in the split spinous processes so as to bridge the diseased area well above and below, with 85.25 per cent results following 539 operations collected from various clinics. The disease was arrested in 460; improved in 59; and unimproved in 20 (Fig. 2).

Of 405 patients with Pott's disease observed at the Mayo Clinic from September, 1912 to January, 1918, 100 were operated on by a modified Albee bone grafting method.

Age

9	were	patients	between	1	and 10	years
5	"	"	"	11	and 20	"
56	"	"	"	21	and 30	"
19	"	"	"	31	and 40	"
7	"	"	"	41	and 50	"
4	"	"	"	51	and 60	"

Average age of the patients 25 years.

Sixty-five per cent were males and 35 per cent females. Eight patients had had symptoms less than one year; 24 had had symptoms for from one to two years; 21 for from two to three years; 13 for from three to four years; 10 for from four to five years; one patient had had symptoms for nineteen years.

Twenty-two gave a history of trauma to the area involved; 78 did not mention an injury. Twenty-seven had had tuberculosis in other organs, lungs, joints, testieles, peritoneum, and so forth, before symptoms were manifested in the spine. Symptoms of paraplegia were present in 7 and were not considered contraindication to operation.

The disease was located in the high dorsal region in 2 patients; middorsal in 14; low dorsal in 27; dorso-lumbar in 11, and lumbar in 46. Definite abscesses existed in 8 patients, suppurating sinuses in 9, and deformity in 78. Previous treatment had been unsatisfactory and had consisted of the application of casts and braces, and in 3 of the cases bone grafting had been done elsewhere.

In all instances a thorough clinical examination should be made with special attention to

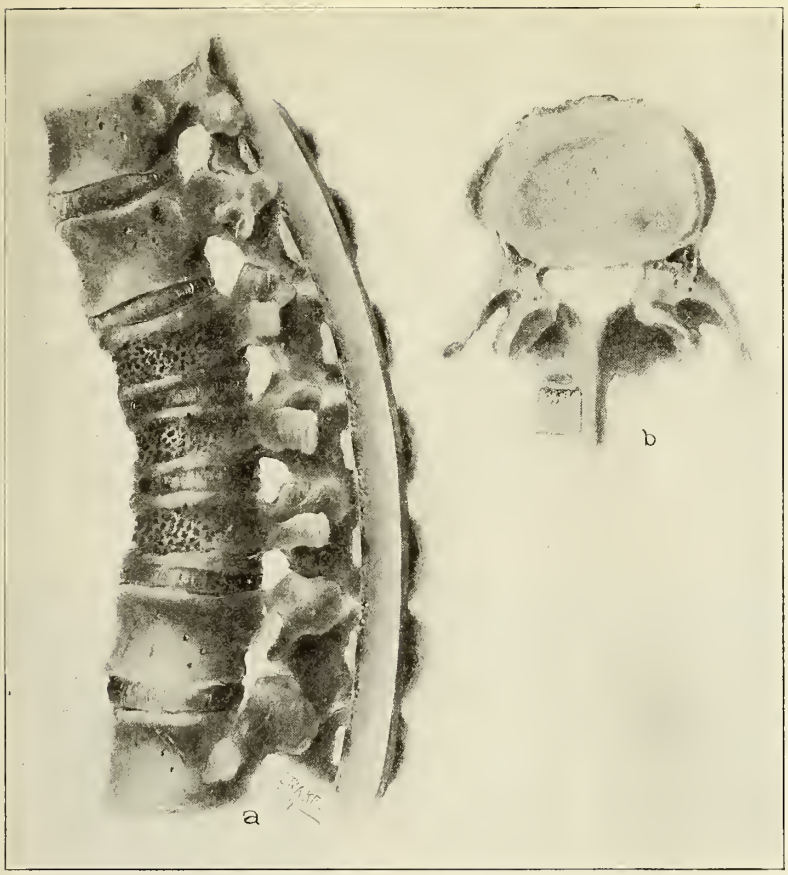

Fig. 2. a. Modified Albee operation. Lateral view showing a curved graft placed so as to bridge two vertebrae above and two below the tuberculous lesion.
b. Superior view to show graft in position.

locating the primary focus. The x-ray is indispensable in determining the extent of the disease, and the amount of calcification, and frequently it demonstrates abscess formation and old healed tuberculous pulmonary lesions, otherwise difficult to diagnose. While Pott's disease may usually be diagnosed without difficulty, the x-ray is of great value in the differential diagnosis. The von Pirquet test serves a limited field in the very young and its value decreases with advancing age. Blood count, temperature, and so forth, aid in giving clues to anemia, secondary infection, and the activity of the disease.

It has been our experience that the most favorable results are to be obtained by a proper selection of patients to be operated on and the continuance of the conservative treatment after operation until, in the judgment of the surgeon, the disease process has been arrested. The bone graft used in our cases was curved to fit the deformity (Fig. 3). The very young and those adult patients who present formidable complications are treated conservatively. Recumbency, rest, and general physical hygiene are essential in all cases. Patients under 5 and adults who present complications, such as sinuses and pulmonary tuberculosis, should be treated by means of the Bradford frame for a period usually from six months to one year, or until the disease has been arrested. This is followed by plaster of Paris casts applied so as to take off the weight-bearing from the diseased area and give the spine as much fixation in extension as is possible (Fig. 4). Still later a Taylor spinal brace is applied. In some instances when the general condition has improved, but the symptoms of spinal disease remain unarrested after such treatment, bone graft operation may be resorted to with benefit and the braces afterward removed. The Calot jacket and suspension jury masts are useful, especially when the disease attacks the upper dorsal and cervical spine. When the jacket is properly applied it will give beneficial fixation (Fig. 5). Many patients have been treated by cast and brace which fail to support the weight above the diseased area. The result of the application of such apparatus is more harmful than beneficial, since it acts as a restrictor of respiration and adds to the weight and discomfort of the already overburdened body. A properly applied jacket allows breathing space, it hyperextends the spine, and supports the weight above the necrosed area. All braces should be applied under the supervision of the

attending surgeon and never left to the bracemaker, for, while the latter may be proficient in the making of the brace, the principal and adjustment require a knowledge of the extent of the disease itself.

What has been said of the cast and its application may be said also of the brace. Many are positively harmful. Recumbency without doubt is the most satisfactory aid to treatment. When early diagnosis is made, and fusion is induced surgically, reinforced later by some means of external fixation, and general antituberculosis treatment is adopted, marked deformity and complication will soon become rare. Tuberculosis when healed by nature most often leaves the unfortunate a cripple, perhaps with draining sinuses, and not uncommonly, paralyzed. The Rollier sunshine treatment should be urged, and it should be instituted while the patient is under control. Medication may be indicated when anemia of a secondary nature is present but in many instances good nourishing diet, cod liver oil, and fresh air and sunshine meet all the requirements. Inasmuch as the lesion in the spine is a local manifestation of a disease process which has probably had its origin in a primary focus in some other part of the body, the general hygienic care of the patient is of first importance. A rule with regard to the period of recumbency would be impractical, especially in conservative treatment, since the conditions as to activity, extent, and abscess complications vary so much at the time the patients present themselves for treatment.

It is somewhat difficult to decide when the patient should be alowed to get up after operation, and the judgment of the surgeons varies in different clinics. Usually the patient's relief and desire to move, is of value, and when his temperature is normal and he is free from pain and muscle spasm, he may be given permission to sit up after a properly fitted brace has been applied. Later an x-ray is taken; the amount of calcification and union found are of importance in determining the extent of repair. At the clinic the period of recumbency and the time on the Bradford frame is determined by the condition of the patient after repeated examinations; no definite time for conservative treatment is established. After the period of recumbency a cast is applied, and still later a spinal brace. All the while the patient and his

Fig. 3. a. Incision in the skin to expose the flat internal surface of the tibia. The dotted line represents outline of curved bone graft removed by bone saw.
b. Cross section of tibia showing the shape and comparative size of graft.

relatives are impressed with the value of the general eare, especially the fresh air and sunshine (Rollier). All patients treated by recumbency should be kept in an institution long enough to instruct the parents or other relatives with the method; in this way much better results are obtainable and the parent who is alarmed on seeing the child on the frame for the first time will later become a firm believer in the value of the method. The great danger is in the first week when the child eries and the parent desires to hold or rock the child, thus halting or breaking up the treatment. A ehild with tuberculosis of the spine almost never eries to get off the frame when once its back has become aceustomed to the new position and the pain is relieved.

While the time of recumbency cannot definitely be given, a year will usually suffice, especially if hyperextension and heliotherapy are combined with fresh air, and proper food and nursing. In surgical cases the time of recumbency is lessened; in most of our cases the patient is up and about in six weeks with a east or brace. Care must be taken not to fracture or loosen the graft, since during recumbeney and when the patient is turned, as well as when he is up and about, the spine must be kept from rotation and flexion. Nurses are taught to turn the patient by rolling, the shoulder and thigh being grasped so as to prevent twisting of the spine. A well fitted east, split before operation and padded and re-applied immediately after, is the best method of fixation in bed. A stiff bed should be used, however, and the spring reinforced with transverse boards. During the sixth week the brace is applied while the patient is in bed; he is allowed to become aceustomed to the upright position on a back rest and later to sit in a chair. Within the next few days the patient in most instances begins walking and is then cautioned against removing the brace unless he is recumbent.

It is obvious that the reported results vary according to the interpretation of eure. It is considered desirable to express value of treatment in terms of improved and unimproved conditions. If the patient is relieved of pain and is able to return to activity, although the deformity and even evidence of psoas abscess

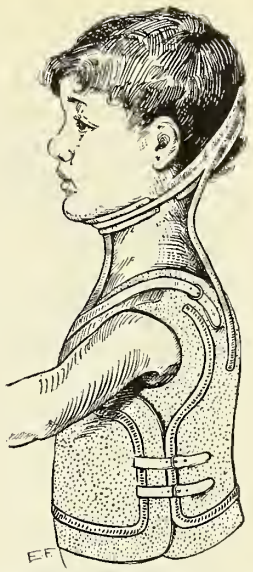

Fig. 4. Support for surgical Pott's disease consisting of steel bands reinforced by leather, plaster paris or celluloid.

remain, he should be considered as benefited by operation and is so reported in this series. All patients are advised against heavy manual labor, but some have returned to farming and one to the occupation of lineman, which requires climbing telephone poles.

Eighty-six per cent of the patients in the series have been relieved of elinical symptoms. Three patients are unimproved; 3 have not been heard from. Eight patients have died since operation: (1) One child aged 4 who had had symptoms for two years, and presented a kyphos was operated on and recovered sufficiently to attend school. Death was reported eighteen months after operation, due to tuberculous meningitis. (2) A woman aged 26, who had had symptoms five years, died twenty-two months after operation of tuberculous peritonitis. The postmortem examination showed the graft ankylosed and the spine healed. (3) The death was reported of a man aged 51 who had had symptoms for two years, but no eause or date was given. (4) A woman aged 26 died from tuberculous peritonitis. She had been dismissed with a brace, apparently improved. (5) One man aged 35 had had symptoms three years. He died from miliary tubereulosis, tuberculous adrenals, tuberculous spine, and so forth. (6) A man aged 24 with symptoms of eighteen months' duration died six months after operation; the

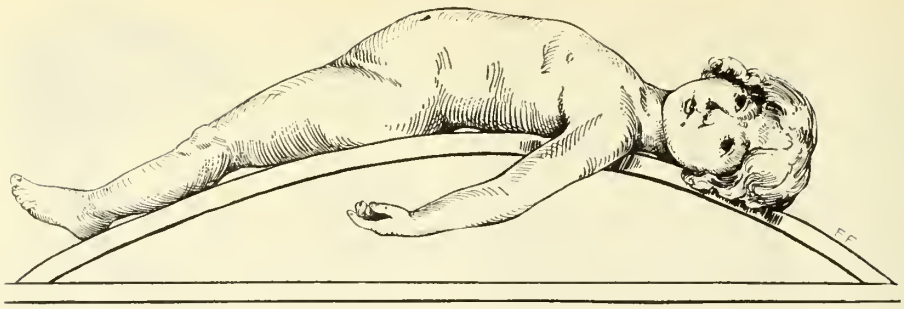

Fig. 5. Bradford frame showing hyperextension obtained.

cause is not known. A psoas abscess was present at the time of operation. (7) A man aged 24 with six years of symptoms died of pulmonary embolism the twelfth day after operation while still recumbent as he was reaching out for a book. (8) A man aged 39 whose condition was complicated by an old pulmonary tuberculosis and who had had spinal symptoms one year, died of meningitis thirteen days after operation; the cause of death was tuberculous meningitis.

SUMMARY

1. The fusion operations of Hibbs and Albee for tuberculosis of the spine have given a means of internal fixation which shortens recumbency, prevents further deformity, and tends to hasten the healing of the diseased process.

2. The diseased process in the vertebral bodies is not eradicated by the fusion operations and relief of symptoms does not mean cure of the disease.

3. The value of general anti-tuberculous measures is of primary importance and should be insisted on.

4. Recumbency and external fixation are still necessary adjuncts to successful treatment and should be carefully carried out.

5. Abscesses should be let alone unless they cause discomfort or pain, or are secondarily infected, when they should then be carefully aspirated and injected.

6. A primary focus which may be determined in a small number of cases indicates a general disease of which the spinal symptoms are manifestations.

7. Children under 5 and adults with active pulmonary lesions and sinuses are poor risks.

8. Paraplegia does not contraindicate operation for fixation.

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DISCUSSION

DR. C. C. CHATTERTON, St. Paul: In cases of Pott's disease we usually find some source of the infection. We find in practically all these children enlarged inguinal glands, enlarged glands at the cervical region, and we may find tuberculosis of the tonsil. We may find kidney trouble of tuberculous origin, or we may find a tuberculous epididymis. I believe, as Dr. Meyerding has said, tuberculosis in the spine is always secondary to tuberculosis in some other part of the body, therefore, tuberculosis must be a general systemic disease.

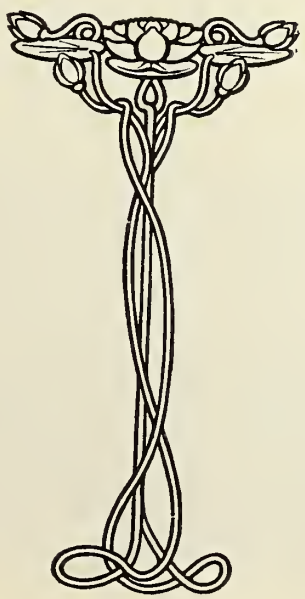
The treatment of Pott's disease, I believe, depends upon the age, the condition of the patient, and the position of the disease in the spine. I think the position of the disease in the spine is most important. We are very well satisfied when tuberculous disease in the cervical region is treated by the jury-mast. In the upper dorsal region, especially with disease in the first, second and upper dorsal vertebrae, where we have constant motion from breathing, the treatment is absolutely unsatisfactory with any type of support I know of. In the lower lumbar region, we need some outside fixation which we cannot get from a support or brace. In the mid-dorsal low-dorsal, and upper lumbar regions, we feel satisfied with a support that will hyperextend the spine. The results are good.

I was glad to hear the doctor say they operate on practically one case in four. Our series is much smaller and we operate only one in ten. In children

under ten years of age our operations with Albee grafts are unsatisfactory; the grafts have disappeared in several cases and the graft always has loosened and did not give support. We found that after operation complications would go on but people seem to think that the patient will be cured. That is not so because we may have abscesses, paraplegia, tuberculous meningitis, and amyloid degeneration develop.

The doctor said that hygiene was an important feature in connection with treatment. I still believe that hygiene is the thing that cures tuberculosis, together with fixation by whatever method you may use. I think in small children the ideal treatment is bed treatment on a frame.

DR. CHARLES A. REED, Minneapolis: I think Dr. Meyerding has given us a very fine, conservative and comprehensive paper, and I only want to emphasize one thing he has said in regard to the Albee operation. There are many men who would not think of taking care of a case of Pott's disease, either from personal disinclination or from a lack of experience, but immediately they find that they can do a bone grafting operation they do an Albee operation and take care of the disease. If you do not wish to take care of Pott's disease conservatively, do not put in an Albee graft or resort to other surgical treatment. In cases of doubt, especially in children, use the recumbency treatment with a Bradford frame, and your results will be better than any other treatment if you keep them in recumbency.



VAGINAL DRAINAGE*

FREDERIC J. PLONDKE, M. D.
Chief Surgeon, St. Johns Hospital
St. Paul, Minn.

It is the consensus of opinion among gynecologists that pyogenic infection of the female genital tract is usually of gonococcic origin; that if unmolested the products of such infection in the majority of cases, eventually become quiescent and often entirely sterile; also, that the lesser number of cases not caused by gonococci are due to bacteria that are capable of and do retain their vitality for an indefinite period. As it is impossible to determine definitely the nature of the infection at the time of operation it is evident that the surgeon who disregards a possible causitive factor other than the gonococcus, is apt to find himself in serious trouble. Some operators are so bold that they close the abdomen in all chronic pustube cases. Others drain the doubtful ones, still others drain all cases. Our experience has led us to side with the latter. We believe that in the light of our present knowledge, namely: that staphylococci, streptococci and other long-lived organisms are often the infecting agents, it is safer to drain all cases where pus is spilled during the operation. We sometimes go still farther and drain where large areas are stripped of peritoneum and oozing cannot be completely controlled. We would hesitate somewhat to recommend the latter if abdominal drainage were to be used, but with the method to be described it is believed that the results justify the means.

In a paper published in "Surgery, Gynecology and Obstetrics" February, 1916, Coffey advocates immediate operation in all cases of acute gonorrheal salpingitis, giving his reasons as follows: "By doing the operation at this (acute) stage the patient's suffering is cut off at once. The ovaries are saved in good condition and the possibility of serious adhesions with perforation into the bowel is completely removed and the patient is cured and the likelihood of permanent incurable discharge from the uterus is very much lessened." He then

*Read at the Sioux Valley Medical Association, Sioux City, Iowa, January, 1920.

Fig. 1.

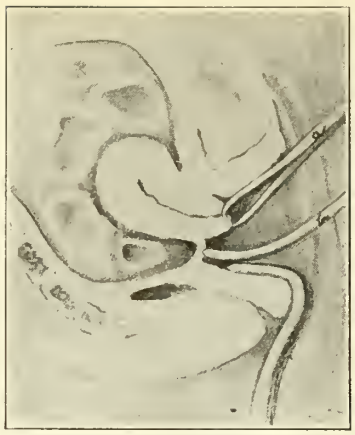


Fig. 1A

describes in detail an abdominal drain consisting of twenty to thirty gauze wieks laid across the abdomen reaching down into the pelvis. The intestines are shut off by five or six layers of gutta percha tissue. The gauze is removed in six days and the gutta percha in two weeks. It takes the wound five or six weeks to heal.

That there is logic in Dr. Coffey's argument cannot be denied and if all such cases could be treated by men of Coffey's ability we might concur in his opinion, but in view of the fact that a great number of these unfortunates must fall into the hands of incompetent and inexperienced operators and the further fact that practically all recover from the acute stage and many permanently, we would hesitate to make this procedure a general recommendation. On the other hand it must be admitted that many such abdomens are opened under mistaken diagnosis. Then, if proper drainage is not provided the mixed infection brought about by the operation is almost sure to prove disastrous, and, here it is important to know that in these acute cases, the ordinary drain, as split rubber tube, cigarette etc., placed from above, is totally inadequate. We quote Coffey at length, not to condemn or even criticize, but to compare the results of an approved abdominal drain with a method which in our hands has proved easier, simpler, safer and in every way more satisfactory; which brings us to the subject of our paper.

In order to emphasize the advantages of draining through the vagina, one need only refer to some of the draw-backs of drainage from above. They are a long tedious convalescence, a nasty discharging wound, a possible permanent fistula, an unsightly scar and a weakened abdominal wall with its danger of postoperative hernia. On account of these objections, the writer has for a number of years past, substituted vaginal for abdominal drainage whenever possible. Not alone in pelvic abscess and other pathologic conditions that can be relieved by opening the cul-de-sac from below, but also in those cases where an abdominal operation with drainage of the pelvis and lower abdomen is required. Every surgeon is familiar with the method of puncturing the vaginal wall to evacuate the cul-de-sac. It therefore needs no attention here. Drainage through the vagina by placing the tube from above has been very satisfactory in our cases, both for immediate effects and end results.

Our method is as follows. When careful examination reveals a condition that suggests a probable necessity for drainage, the patient, after being anesthized is placed in the lithotomy position, a weight speculum introduced, and the vagina swabbed dry with a sponge; Tr. of Iodine is then applied to the vaginal wall and cervix; the posterior lip of the cervix is grasped with a tenaculum forceps, (Fig. 1 and Fig. 1 A-a) and drawn forward. A fold of mocosa about one half inch posterior to its junction with the cervix (Fig. 1 and Fig. 1 A-b) is grasped with a long, curved rat toothed forceps, (Fig. 2) with the point directed forward. The forceps is left in this position. When the hand releases the forceps it will rotate one-fourth to one-half way round. It is important to note which way it turns so as to

Fig. 2.

Fig. 3.

instruct the nurse how to manipulate it later. The speculum is removed and the patient placed flat on the table, the parts prepared and the abdomen opened in the usual way. If during the operation the peritoneum becomes soiled, or for other reasons drainage is decided upon, the uterus is grasped with a uterine elevator, (Fig. 3) and pulled forward and upward. (Fig. 4-a). A nurse or other attendant, who need not be "clean," passes her hand under the cover from below, grasps the handle of the forceps and brings it in position so the point is directed forward. With force from below the point of the forceps (Fig. 4-c) is plunged through the vaginal wall until it emerges in the cul-de-sac; the hand of the surgeon, (Fig. 4-d) which may be covered by gauze or towel (Fig. 4-b) protecting the viscera above. The blades of the forceps are separated (Fig. 6-b) thereby enlarging the opening. If deemed advisable the opening can be further enlarged by stretching with the fingers from above. If preferred the opening in the vaginal wall can be made from above with sharp, pointed, curved scissors (Fig. 5-a) using the point of the forceps (Fig. 5-b) in the vagina as a guide. The end of a good sized rubber

Fig. 4.

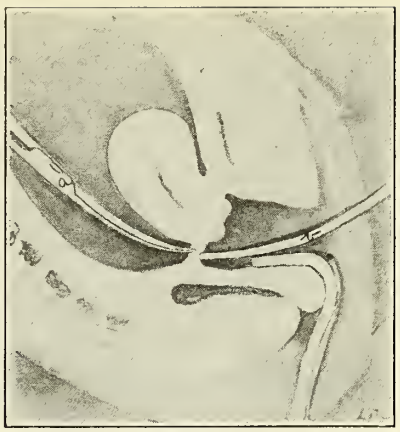


Fig. 5.

tube and one or two strips of iodoform gauze, (Fig. 6-a) are placed between the open blades of the forceps (Fig. 6-b) The forceps closed, and holding the tube and gauze is withdrawn through the vagina. The upper end of the tube, which is allowed to extend about two inches into the cul-de-sac is fastened loosely to the posterior surface of the uterus with one stitch of plain cat gut (Fig. 7-a). The gauze (Fig. 7-b) is used to keep the wound open, to control oozing and prevent adhesions between the intestines and denuded surfaces. The omentum is pulled down and the lower end carefully tucked in between the uterus and intestines. This is important for it thus provides an avenue of escape for the infected secretions higher up, guiding them to the drain in the most dependent part. As the success of any drain depends largely on the reversal of the lymph circulation, which latter is stimulated by irritation, such as caused by trauma or foreign material, it is obvious that if the omentum, with its rich lymph supply, is brought in contact with the injured part, or still better the drain itself, it will aid materially in producing the desired results. When, on account of the distended intestines the omentum does not readily reach to the pelvis we sometimes, in acute cases, attach it loosely to the posterior surface of the uterus with a plain cat gut stitch. Objections may be raised against the latter procedure because it is apt to leave the omentum adherent to the uterus, but when we consider that many of these operations are life saving measures and that the omentum is na-

Fig. 6.

Fig. 7.

ture's drain, far superior to any artificial one and further that omental adhesions in the pelvis seldom causes serious trouble, then, even though such adhesions should occur, the benefits derived easily offset the objection. The abdomen is closed, as in a clean case and the patient placed in her bed in a semi-sitting position. The gauze is removed on the third or fourth day. The tube will usually come away of its own accord when the cat gut stitch holding it is absorbed. While this method of drainage is especially applicable in badly infected tubes with extension to adjacent parts, its use is by no means limited to this condition. We have, in a considerable number of cases of appendicial abscess and in peritonitis from various causes, drained through the vagina. In the latter cases, however, if indicated, the tube is allowed to project through the abdominal wound, or a separate tube is placed above, thus providing drainage from below and above.

After a few days the upper tube is removed, or, if only the one tube is used, it is cut off above, then by traction below is drawn through the vagina until the upper end rests in the cul-de-sac as already described. This allows the abdominal wound to heal, thereby shortening the convalescence. When the tube comes away, or is removed, a douche is given once daily until the discharge ceases. Excepting the annoyance of a slight vaginal discharge for a time, patients thus treated enjoy every advantage of a clean operation. Chronic cases are up and about in ten days and leave the hospital in two weeks, acute cases only a few days longer.

We prefer, then, to drain through the vagina, because:

1st. It eliminates all the objectional features of drainage from above.

2nd. It is more efficient, more comfortable for the patient and needs less attention.

We prefer the above described technique because:

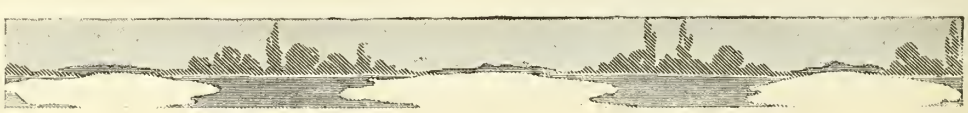
1st. It is simple and comparatively easy.

2nd. By preliminary preparation of the vagina the entire procedure is surgically clean.

3rd. That attendant who manipulates the forceps in the vagina need not be "clean" and does not disarrange the aseptic covering.

4th. By suturing the tube to the posterior surface of the uterus it cannot come away until the cat gut stitch is absorbed, then it comes away easily and without pain.

5th. It does not require the assistant's fingers in the vagina to act as a guide and consequently eliminates the danger of the fingers being passed into the rectum, and the bowel opened from above by mistake. If drainage is not required the forceps is removed and no harm is done by the preliminary preparation.



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EDITORIAL

GRADUATE MEDICAL WORK

This article is intended to show how the graduate medical work at the University of Minnesota is administered and to supply some information in regard to the purposes and methods of instruction.

The Graduate School is the division of the University which offers instruction in advance of the bachelor degree in arts or science, or in advance of the first degree in a professional school. It is consequently the division chiefly concerned with research and with the training of investigators and specialists of all kinds. The dean of the Graduate School is Professor Guy Stanton Ford, chairman of the department of history. The school has an executive committee representing the great groups of subjects, such as social science, natural science, medicine, agriculture and education. It has a faculty consisting of men in any department of the university, who are chosen by the dean and executive committee as fitted to give advanced instruction and train research students. The Mayo Foundation for Medical Education and Research is a part of the Graduate School and certain of its members are on the Graduate School faculty. Similarly, certain members of the medical faculty are members of the graduate faculty.

All graduate work is conducted under general rules prescribed by the graduate faculty, but the detailed control of each great branch is under a special committee; for example, the committee for agriculture and the committee for medicine. The latter committee consists of the president of the university, the deans of the Graduate and Medical Schools, Director Louis B. Wilson of the Mayo Foundation, Professors C. M. Jackson, J. C. Litzenberg, L. G. Rowntree, and J. P. Sedgwick of the Medical School, and Professors D. C. Balfour, W. F. Braasch, and M. S. Henderson of Rochester. The committee is the immediate administrative body for all graduate work in medicine and makes recommendations to the regents and to the dean and executive committee of the Graduate School on the acceptance of students, the appointment of fellows, the appointment of members of the graduate faculty, the conferring of degrees, etc. Particularly this committee is charged with recommending the annual budget of the Mayo Foundation.

Under this organization a student may work for the degree "Master of Science" or the degree "Doctor of Philosophy" in any of the preclinical sciences such as anatomy or pathology, or in clinical branches. For admission to graduate work in the sciences a bachelor's degree is required; for work in the clinical branches the M. D. degree and a year of internship are required, in addition to the bachelor's degree or equivalent.

Many of the graduate medical students—but not all—hold fellowships. By this is meant that they receive small annual salaries and are expected to give a certain amount (not exceeding half time) of service. At Minneapolis the fellows assist in the clinics or in teaching medical students, or in the conduct of the University Health Service. The Burch Fellow assists at Dr. Burch's office. There is a new fellowship in tuberculosis supported by the Hennepin County Anti-Tuberculosis Committee, the holder of which will work in that field. At Rochester the fellows assist in the Mayo Clinic, the hospitals and the laboratories. Educationally this service, whether teaching or assisting is valuable because it contributes to the students' knowledge and power. Economically the system of fellowship finds endorsement in the fact that few men are able financially to undertake a long graduate course after the six years of the regular

medical course and the year of unpaid internship. It is not essential to the plan, however, that all graduate students hold fellowships. Some pay their own way and carry on their studies without obligation of service.

All graduate teaching is essentially individual. There are few classes; few required lectures. Every student is under a faculty advisor who is responsible for making out the student's program from year to year. Every student selects his "major" subject and also a "minor" or supporting subject. For example, Major in Pathology, and Minor in Anatomy, or Major in Pediatrics and Minor in Biochemistry. The student's advisor must see that the student gets thorough all round training in his "major," a fair knowledge of his "minor," and also sufficient knowledge of any other work which may be fundamental to either major or minor.

The purpose of the Graduate School is to make productive scholars. The training of scholars takes time; hence the rules requiring at least two or three years for an advanced clinical degree. A scholar must be familiar with the literature of his specialty; hence the requirement of a reading knowledge of French and German. The test of productive scholarship is original investigation; hence a thesis involving new facts in some phase of the major subject is required. The certification of advanced scholarship is a serious responsibility; hence the Graduate School demands searching written and oral examinations of all candidates for degrees.

These in general are the requirements. They are quite different from those of an undergraduate school. There is no "hand feeding," no formal reciting, no prescribed lessons, no reporting of absences, no routine laboratory exercises. The essential environment consists of libraries, laboratories and clinical material, with competent supervision—and, above all, criticism. The student with his advisor as a guide is turned loose to educate himself. Mostly he learns by doing, which is the natural way. If he has "stuff in him," he arrives. If he is only an imitator or absorber or bluffer, he shows what he is.

In the winter quarter the University of Minnesota had 156 graduate students in medicine, 37 of whom were at Minneapolis and 119 at Rochester. This is the largest number of strictly graduate medical students anywhere. About 20 will come up for degrees at the coming commencement. The student body is of very high order. There are many more applicants than available places, particularly in surgery and pediatrics.

It is believed that the University of Minnesota has the best worked out plan of graduate medical instruction to be found any where. It is believed that it will produce leaders in science and leaders in medical practice. The formulation and actualization of this plan constitutes the most distinctive movement in medical education of the last decade.

The reader will be likely to say: "Such a plan evidently will produce highly trained specialists and researchers but what does it offer to the busy doctor who desires to spend a few weeks brushing up and learning new things?" It should be borne in mind that the practitioner needs well organized, intensive, short courses, with the opportunity of seeing a large amount of clinical material. The University Medical School could not offer satisfactory work of that kind for the reason that its facilities and teachers are fully employed in undergraduate instruction. For a professor to take informal charge of one or two advanced students is quite different from the conduct of classes of short time students. The latter type of work should be provided in great centers of population, using clinical material not employed for undergraduate teaching. Our university, however, opens its regular classes and clinics to physicians, who also can usually get opportunities for work in animal and cadaver surgery, dissection and other laboratory subjects. With its present equipment and staff the university would not be able to offer more to the short course student, even if the advanced and strictly graduate work were not carried on.

Graduate work in medicine is just beginning. Specialists have been largely self-made, for there was no other way. That time is passing. Systematic training and formal certification of proficiency by educational institutions will constitute the regular road to a specialty, just as they do to general practice. Our university has made a pioneer movement in this direction, which has created much interest in educational circles. Much remains to be done. It is essential that the facilities in the Twin Cities be de-

veloped equally with those at Rochester. It is essential that broad wisdom be exercised in the use of the Mayo Foundation endowments. It is essential that medical education should have the cordial support of the medical profession.

E. P. L.

WHAT IS THE RELATION OF VOLUNTARY PUBLIC HEALTH WORK TO THE MEDICAL PROFESSION?

To make the answer concrete, what is the function, say, of the Minnesota Public Health Association in Minnesota?

The answer is, to interpret to the public what medicine, surgery, and public health, mean in the scheme of things. Neither the medical profession nor official public health bodies can do it; and somebody should.

Why cannot the medical profession or official bodies do this? Because, as everyone knows, any effort in that direction by the medical profession is looked upon by the public as the self-assertiveness of a special class, booming its own business; while the official bodies have been specifically denied funds for the purpose, as giving undue advantage to one department of the government in the race for popular support and increased appropriations in which all government departments are engaged.

Now medicine, surgery, and public health, in the Great War, once and for all demonstrated themselves as one absolute essential of success in Big Business. They showed themselves to be not philanthropies, not fads, not conscientious (or unconscientious) doctrines or beliefs, but hard featured necessities—without which there would not have been a Great War at all. The Medical Corps showed itself to be as essential a part of the proceedings as the engineers or the artillery or the submarines or any other one of the contributing branches; and moreover it showed itself as fundamental to all of them. Yet the public do not see it. Public Health Legislation asked by the Medical profession, however altruistic, is suspected and often condemned merely because the medical profession asks it. The recent movement amongst medical men to keep out of legislation designed for the public good, to advise and warn, but no longer actively to seek reforms in public health, is the outgrowth of the reception their altruistic efforts have in past times received. On the other hand official public health bodies are under the same ban of suspicion. They likewise are held to be pursuing power or prestige whenever they ask progress.

But a voluntary association is as free as air to propagate anything; and therefore surely to propagate good things. No legislature, no sect, medical or religious, or both, no body of the people nor the people itself as a body, can limit or destroy a voluntary body—for a voluntary body is in just as good standing as the people themselves, since it is made up of themselves; and in a free country the voluntary association can go as far as it likes, within the law, because it is voluntary, because it does not represent a sect, medical or religious, because it is not part of the Government.

That such a voluntary body has tremendous moral and ethical responsibilities, the greater and the more onerous just because it is free, just because nothing but itself can control its policies or its action, goes without saying. That to be successful it must supply a public want is also obvious, for if it is not wanted, its support, which is purely voluntary, elastic and fluid, would necessarily disappear. The financial record of the Minnesota Public Health Association since 1914 when it was organized is proof enough, without another word, that the public want it; the public gave it funds by voluntary contribution through the Christmas Seal Sale to spend in

1914	6,000.00
1915	20,000.00
1916	30,000.00
1917	40,000.00
1918	88,000.00
1919 (War chest grant)	97,000.00
1920	144,000.00

Need any more be said?

A very large number of medical men belong to the association—yet it is not a medical association. A good many women belong to it, but it is not a women's organization. A great many officials, State, County and Municipal, belong to it, but it is not an officials' organization. It works on a big scale in the public schools and has many teachers connected with

it, but it is not a school organization. The Northwestern Pediatric Society, the State Dental Society, the Minnesota Ophthalmological Society, the Minnesota Obstetrical and Gynecological Society, the Medical Directors of the County Sanatoria, the University of Minnesota, supply specialists for its clinics, but it is not a clinical or a University organization. Its members are simply anyone interested in public health. Every member has a vote; it has one hundred directors elected by the members a great many nominated by the 87 constituent County Public Health Associations; and these directors control its policies, elect its officers, conduct its business.

The only great State Association interested in medicine in any phase not directly co-operating with The Minnesota Public Health Association is the State Medical Society! True the State Medical Society at its meeting last fall endorsed the Minnesota Public Health Association, its work and its financial policy, but there is room and to spare for the State Medical Society to do active public health work that is not legislative, that is not jealousy-provoking. If the specialist societies can do it with great satisfaction and success, why not the State Medical Society? A concrete plan will, it is hoped, be ready for submission to the State Medical Society soon. H. W. H.

FAITH HEALING

The subject of faith healing has recently been brought into prominence by the advent to the Twin Cities of an English layman, Mr. Hickson who is credited by some with having a gift for healing through the laying on of hands. He, however, claims to be nothing in himself but merely the agent through whom Christian faith has its working.

It was a pitiful sight to see the hundreds, yes, thousands of invalids for the most part beyond the help of the medical profession who thronged the churches, grasping, as it were, like a drowning man at a straw. To maintain that those who were not benefited were lacking in faith is unfair to many who sought aid. It is also illogical to declare the few cures or at least improvements to be miracles. A cure following the laying on of hands is no more miraculous than the curing of an hysterical paralysis by psychotherapy; the improvement in the walking of a rheumatic no more miraculous than the improvement through muscle reeducation of the walking of a tabetic.

The medical profession has been accused of being lacking in spirituality. We plead guilty. We are human. Yet many physicians, we are thankful to say, have a spirituality which is expressed in deeds.

The question arises whether a physician called to see a case would be justified, in fact would not be severely criticised, were he to precede the examination by some spiritual proceeding such as offering a prayer. The making of a diagnosis is a purely mental procedure, a logical weighing of the facts until the diagnosis is reached. Certain scientific methods offer reliable data to base opinion upon. Much depends on the art of the examiner.

Are we to discard past experiences the experience of brainy men who have devoted their lives to the study of human ills, many with the highest incentive of relieving human suffering, and put all our reliance on religious faith? No. If we as a profession have been guilty of over-emphasizing the physical, neglecting the mental influences in some cases and the spiritual side of the patient in most cases, Mr. Hickson can be rightly accused of over-emphasizing the power of the spiritual side of a man's makeup.

Human beings are too complex in their physical, mental and spiritual makeup not to employ specialists in each of the three fields. The clergyman is trained in supplying the spiritual needs of men; the physicians, the physical needs. Both may and do work through their mentality, both working at times equally remarkable cures of functional disorders. If a faith healer and Mr. Hickson in particular can increase men's spirituality, well and good.

We believe Mr. Hickson is a sincere and conscientious man and would be only too ready to abandon all therapeutic measures known to science and resort to religious faith alone, did common sense permit.

CHANGE IN EDITORIAL STAFF

Minnesota Medicine takes great pleasure in announcing the addition to its editorial force of Dr. S. R. Maxeiner of Minneapolis. Dr. Maxeiner's name will replace that of Dr. E. M.

Hammes as assistant editor and he will take charge of the department of Progress in Medicine and Surgery. This department, beginning with the June issue, will be divided into five sections as follows: Medicine, in charge of Drs. F. J. Hirschboeck of Duluth, and F. O. Woodward, Minneapolis; Surgery, Drs. V. C. Hunt, Rochester and Wallace Cole, St. Paul; Gynecology and Obstetrics, Drs. A. L. McDonald, Duluth and A. G. Schulze, St. Paul; Pediatrics, Drs. F. C. Rodda, Minneapolis and Roy Andrews, Mankato; Roentgenology, Drs. A. W. Desjardins, Rochester and R. G. Allison, Minneapolis.

Members of the Minnesota Medical Association who are interested are asked to send in short abstracts of valuable articles appearing in medical publications, the A. M. A. Journal excepted. It is felt that this last mentioned journal is so universally read that too much unnecessary duplication would result. Signed abstracts should be sent direct to one of the proper section heads.

Dr. Paul Berrisford of St. Paul, has supervision of Book Reviews. Any society member who encounters an interesting medical book would do a favor to the readers of Minnesota Medicine if he would submit a short signed book review directly to Dr. Berrisford for publication.

DAKIN'S SOLUTIONS

In a discussion by Dr. A. N. Collins of Duluth of the papers of Dr. Manson and Dr. Strachauer, published in Minnesota Medicine for March (page 131), Dr. Collins was misquoted to the extent that readers must have obtained an erroneous idea of the various "Dakin's Solutions."

Dr. Collins remarks were published as received from Mr. Whitford, the official stenographer for the last State Meeting. Mr. Whitford reports that discussions of paper presented before the society were not referred to the respective doctors for revision. This we feel should be done if not by the reporter, by the secretary of the State Association or, of necessity, by us.

The following quotation from a communication received from the Abbott Laboratories should correct any mistaken ideas regarding these preparations which might well have resulted from this unfortunate error:—

"Dakin's hypochlorite solution—an aqueous solution of sodium hypochlorite, containing from 0.45 to 0.5 per cent of the salt. This is "Dakin's Solution."

Chlorazene, of Chloramine-T. This is a synthetic chemical, also introduced by Dr. H. D. Dakin, subsequent to the introduction of the hypochlorite solution. Chemically it is paratoluene-sodium-sulphochloramide. Its efficiency depends upon the chlorine, which however, exists only in combined form as chloramine. This substance is a white, crystalline powder, dissolving readily in water, and is employed in aqueous solution, in strengths varying from 0.5 to 4 per cent. In germicidal power it is virtually equal to sodium hypochlorite. It is very stable, both in powder and solution..

"Dichloramine-T. This is the third and most powerful of the germicidal agents, introduced by Dakin. The chlorine is present in combined form, as chloramine. It is a yellowish, crystalline powder, insoluble in water, but readily soluble in chloinated oils, particularily in Chlorcosane, the liquified chlorinated paraffin wax introduced by Dakin. It is applied only in Chlorcosane solution. It is much less stable than Chlorazene, but the germicidal action is more prolonged than that of most other antiseptics."

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

THE NEXT STATE MEETING

The State meeting will occur this year in St. Paul, September 29th, 30th and October 1st.

The Program Committee is now at work in an endeavor to arrange a scientific program that will be of interest to all the members of the State Association.

It is desired that every portion of the state be represented in this program, and to that end the committee invites the members of the State Association to immediately make application for places. Each member making application is requested to forward at a very early date the subject which he desires to discuss together with a one hundred word abstract of the same. Those writing surgical papers should communicate with the secretary of the surgical section, Dr. H. B. Zimmerman, Lowry Building, St. Paul, and those writing medical papers with the secretary of the medical section, Dr. E. L. Gardner, La Salle Building, Minneapolis.

If anyone desires a place on the program, they may insure the same by writing the secretary of the section to which the paper applies, immediately.

EARLE R. HARE, Secretary.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The Southern Minnesota Medical Association will convene for the Mid-Summer Session June 28th and 29th, 1920 at Fairmont, Minn.

The scientific program will begin on Monday, June 28th at 2 P. M. at the High School Auditorium. The banquet will occur the same evening at 6 o'clock at one of the summer resorts, weather

permitting, and the program continued following the banquet.

The ladies of the Association will be entertained at luncheon on Tuesday, June 29th, the luncheon to be followed in the afternoon by an auto ride about the environs of Fairmont.

Headquarters will be at the Hotel Fairmont. The other hotels at Fairmont are: Interlaken Hotel, Hazelmere Hotel and Bullard Hotel.

Hotel reservations should be made at once by communicating with Dr. W. J. Richardson, Fairmont. Application for membership in the Southern Minnesota Medical Association may be made to Dr. H. T. McGuigan, Red Wing, Minn. The program committee consists of Dr. H. W. Meyerding, Rochester, Dr. E. M. Hammes, St. Paul and Dr. A. F. Schmitt, Mankato.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The Southwestern Medical Society will hold its thirty-fourth annual meeting at Windom, Minn. May 13th, 1920. The scientific program is as follows:

Report of three cases of Lethargic Encephalitis, Dr. J. H. Dudly, Windom.

Duodenal Ulcer, Dr. Henry C. Dohms, Slayton.

Empyema, Dr. H. N. Sheldrupp, Minneapolis.

Anaesthesia, Dr. R. M. Waters, Sioux City.

Cancer, Dr. W. E. Richardson, Pipestone.

Some Interesting Things about Tuberculosis, Dr. S. A. Slater, Worthington.

The officers of the Southwestern Medical Society are, Dr. E. G. McKeown, president; Dr. F. M. Metcalf, vice-president and Dr. F. G. Watson, secretary.

MINNESOTA ACADEMY OF MEDICINE

The regular meeting for March was held in these rooms on Wednesday evening, the 10th, twenty-five members being in attendance. Minutes of the previous meeting were read and approved.

It was moved and carried that the society elect at this time one more from the list of pending nominees for associate membership. The choice fell to Dr. C. W. More, Eveleth.

Then followed the selection and election of two active members from St. Paul, Dr. Harry B. Zimmerman and Dr. John C. Brown.

The name of Dr. J. M. Lajoie, Minneapolis, was proposed for membership by Drs. Carlaw, Hynes, Strachauer, and Hamilton.

REPORTS OF CASES

Pyelonephrosis, with Removal of Kidney

Dr. Farr reported a case operated on under novocaine of a man who suffered for twelve years with attacks of pain in the left groin. General examination discovered nothing adventitious. A few pus cells were found in the urine; blood pressure, 128-90; temperature, 100. X-ray, blank for stone. Cystoscopy: Bladder contained much flocculent material; small ulcer near left ureter. Right ureter catheterized without difficulty; normal urine. Left ureter obstructed; urine mixed with blood and pus. Pyelogram showed a shadow in the region of the kidney. At operation 5 ounces of a 0.5 per cent novocain were used. Transverse incision. The kidney was exposed and a large amount of pus evacuated. Kidney removed. An anomalous artery was present and apparently was the cause of the trouble. Pathological specimen exhibited.

Nodular Tumor of the Stomach

A second case reported by Dr. Farr was that of a man 52 years of age who complained of pain in the upper abdomen; worse shortly after eating. No emesis. The kind of food taken made little difference. There was a general loss of strength and an increasing anemia. Blood pressure low. Hemoglobin 50. The x-ray showed a large tumor of the greater curvature of the stomach. The mass could also be palpated. Operated on under novocaine—crucial infiltration of upper abdomen, combined with blocking of sixth to tenth thoracic nerves, left side. Recti divided. Vertical incision in midline to ensiform. Skin dissected back, exposing the ribs, four of which were divided in the axillary line and at their costosternal angle. Only slight glandular involvement. Duodenum divided and inverted. Stomach united by two rows of chromic gut to the jejunum, twenty inches below its origin. The removed tumor was about the size of a large grape fruit. Patient getting well.

Enucleation of Kidney; Resection of Ureter

Dr. Farr reported another case of kidney and ureteral complication. The patient, a man, had had one kidney removed five years before, for stone. Two years ago a suprapubic cystostomy was performed for a large stone in the bladder. He remained well until last month. Examined at this time, the x-ray gave a large shadow about the left kidney. Cystoscopy showed a perfectly functionating right kidney. From the left ureter there oozed a worm-like stream of pus, especially upon making external pressure. The catheter could be introduced for only a short distance into the canal. Operation performed under novocaine. Kidney exposed and opened. A moderate amount of pus and urine came away. Kidney enucleated from its fibrous capsule. Vessels divided. Ureter divided, and freed for about six inches. Through a low McBurney incision (extraperitoneal) the ureter was freed to a point distal to the stone, where it was ligated and severed. Wound drained.

Large Renal Calculus

Dr. Colvin exhibited a renal calculus the size of a normal kidney which had been removed along with the kidney. The patient, 35 years of age, had had

no symptoms of stone, except frequency of urination, since the age of 15.

A Case of Acute Miliary Tuberculosis Associated with Marked Cyanosis and Severe Attacks of Dyspnea, Ending in Death

Such a case was reported by Dr. Head. We are all acquainted with the usual forms of miliary tuberculosis. The type beginning slowly and insidiously like typhoid fever is recognized by all writers. Meningeal form, so well described by Gerhard of Philadelphia, is usually diagnosed, provided care is taken in the study of the case and time enough elapses after the onset to secure the necessary findings and develop the clinical picture. The pulmonary form ought to be the easiest to recognize, but, curiously enough, it is not. This is especially true if roentgenograms or fluoroscopic examinations of the chest are not made. One usually finds the patient with the signs of bronchitis, fever, and cough, coming on acutely. A striking feature, and one which should arouse suspicion, are the blue lips, fingertips, and suffused cheeks, without cardiac disease. Dyspena and the signs of diffuse bronchitis with hyperresonance over both chests, may confuse the picture. While some dyspnea usually is present, Dr. Head says he never before had seen the disease so intensely asthmatic. Breathing was so difficult that morphine had to be given to control the paroxysms.

Walter G. Age 22. Married. Admitted to Base Hospital, Camp Wheeler, Macon, Ga., on December 17, 1919, complaining of cough, fever, and a macular eruption over the face and shoulders. Family history negative. He had had mumps and typhoid fever in 1908, and lues in 1911. He was well until four days prior to admission, when he began to cough. An erythematous eruption appeared on his body; he developed fever, and had to stop drill. On admission to the hospital, a diagnosis of measles with acute bronchitis was made. The note of December 18th reads as follows: "Temperature 101.8, pulse 76, respirations 16. Physical examination reveals impaired percussion note in the left lower base behind, with harsh breath sounds. Numerous sibilant and fine crackling rales, centered more in the left lower base behind, can be heard." The diagnosis of bronchopneumonia complicating measles was considered probable.

On December 21 four days after admission, patient began to develop considerable cyanosis over the face and body. The lobes of the ears, the cheeks and fingernails became blue. Patient complained of difficult breathing and a feeling of oppression over the cheat. Examination of the lungs at this time showed a hyperresonant note over both lungs, and suppressed breath sounds over the right base. Increased whispered voice sounds could be heard in the right base, but no tubular breathing and no increased bronchophony. Temperature 103.4, pulse 104, respirations 36. The leucocyte count was 6,000, P. M. N. 80 per cent, S. Mono. 7 per cent, L. Mono. 13 per cent. Urine negative. Sputum showed type 4 pneumoccus; also non-hemolytic streptococcus. The diagnosis of measles with acute bronchopneumonia seemed established.

During the 23rd, 24th, and 25th of December, the patient's condition remained much the same, except that the cyanosis became more marked and the hyperresonance over both lungs more pronounced. On two or three occasions the patient had such severe attacks of dyspnea that he was obliged to be propped up in bed with pillows and hypodermics of morphine given. On the 25th the rash had entirely disappeared, but the cyanosis and dyspnea were still very marked. On the 26th, the chest findings showed a bilateral hyperresonance with ill defined fine crackling rales over both lungs anteriorly and posterierly; no increased bronchophony; no tubular breathing; no distinct area of dulness. Blood examination: Leucocytes 8,000, reds 4,200,000, hemoglobin 85 per cent, P. M. N. 75 per cent, S. Mono. 11 per cent, L. Mono. 12 per cent, Trans. 1 per cent, eosino. none. Sputum showed no Charcot-Leyden crystals, no Curschmann spirals, but large numbers of eosinophiles. Sputum not examined for tubercle bacilli.

The patient died suddenly in an attack of dyspnea on the 28th, eleven days after admission to the hospital. The final attack came on suddenly, death occuring before any measures could be taken for his relief. The necropsy, made twelve hours after death, showed all organs normal except the lungs. These showed diffuse bilateral miliary tubercles. From apex to base, the lungs were filled with fine miliary tuberles, with no caseation and no cavity formation. Pathological diagnosis was acute miliary tuberculosis of the lungs.

Dr. J. G. Cross read a paper on "Factors in the Prognosis of Chronic Nephritis"; and Dr. C. C. Chatterton read his inaugural thesis, the subject of which was "An Ambulatory Method of Treatment of Old Un-united Inoperable Intracapsular Fractures of the Femur." Following their presentation, both papers were fully discussed by those present.

F. E. Leavitt, Secretary.

NEW AND NON-OFFICIAL REMEDIES

During March the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Abbott Laboratories:
- **Elixir Barbital Scdium.**

Antoine Chiris Company:
- **Barbital-Chiris.**
- **Barbital Sodium-Chiris.**

Gilliland Laboratories:
- **Schick Test (Gilliland)**

Hollister-Wilson Laboratories:
Ampoules Corpora Lutea Soluble.
Extract-Hollister-Wilson.
Ovarian Residue-Hollister-Wilson.
Vitalait Laboratory of California:
Condensed Vitalait.

Anesthesin-Calco.—A brand of benzocaine complying with the N. N. R. standards (see New and Nonofficial Remedies, 1920, p. 33). Calco Chemical Company, Boundbrook, N. J.

Gonococcus Vaccine (Polyvalent) (Gilliland).—A gonococcus vaccine (see New and Nonofficial Remedies, 1920, p. 283) prepared from a number of strains of M. gonorrhoea Neisser. Marketed in packages of four syringes containing, respectively, 250, 500, 1,000 and 2,000 million killed gonococci; also in packages of four 1 Cc. ampules containing, respectively, 250, 500, 1,000 and 2,000 million killed gonococci. The Gilliland Laboratories, Ambler, Pa.

Ovarian Residue—Hollister-Wilson. — The residue from the fresh ovary of the hog, after the ablation of the corpus luteum. It is used for the same conditions as the entire ovarian substance (see New and Nonofficial Remedies, 1920, p. 201) but is claimed to be somewhat more stable. Hollister-Wilson Laboratories, Chicago (Jour. A. M. A., March 6, 1920, p. 675).

Phenacaine.—Holocaine hydrochloride. The hydrochloride of phenetidyl-acetphenetidine, a basic condensation product of parphenetidine and acetparaphenetidine. Phenacaine was first introduced as holocaine hydrochloride. It is a local anesthetic like cocaine, but having the advantage of a quicker effect and an antiseptic action. Five minims of a one per cent solution when instilled into the eye are usually sufficient to cause anesthesia in from one to ten minutes.

Phenacaine-Werner.—A brand of phenacaine complying with the N. N. R. standards. Werner Drug and Chemical Company, Cincinnati, Ohio (Journal A. M. A., March 27, 1920, p. 889).

PROPAGANDA FOR REFORM

Green's Dropsy Remedy.—This "treatment" is sold on the mail order plan and comes in the form of large balls or boluses, some smaller balls or boluses and, in some cases, includes "Tonic Tablets". The balls are taken, followed by substantial doses of magnesium sulphate. The A. M. A. Chemical Laboratory reports that the boluses, large and small, appear to contain powdered squill as their chief medicinal ingredient. The laboratory further reports that the "Tonic Tablets" contain an iron salt, probably dried ferrous sulphate, as the chief medicinal ingredient. Obviously, there must be no small amount of danger for a person in a dropsical condition to dose and drastically purge himself. The product is one that has no legitimate place among home remedies (Jour. A. M. A., March 6, 1920, p. 689).

Stannoxyl.—On the assumption that tin workers were less troubled with boils than the average person, two French investigators proposed the use of tin compounds in the treatment of staphylococcus infections. Based on their work, a proprietary preparation—Stannoxyl—has been placed on the market with the claim that it is "composed of stannous oxid and specially purified metallic tin". Absurdly extravagant and unwarranted claims are made for the product (Jour. A. M. A., March 6, 1920, p. 692).

Hepatola.—This was declared a fraud by the federal authorities in 1917, and the Hepatola Company was denied the use of the United States mails. It is still being sold in Canada. Hepatola is one of the many treatments claimed to remove gallstones. Analysis showed Hepatola to be the same old gallstone trick—that of giving the patient a large dose of some bland oil and following it up with a saline. The soapy concretions that are avoided following this dosing are the "gallstones". Hepatola is essentially the same as "Fruitola" and "Mayr's Wonderful Stomach Remedy" (Jour. A. M. A., March 13, 1920, p. 752).

More Misbranded Drugs.—Boericke and Runyon's santonin and calomel tablets, acetanilid and quinin compound tablets, potassium iodid tablets, and morphin sulphate tablets did not contain the claimed amount of drug, and some aspirin tablets contained no aspirin. Sulferro-Sol was falsely claimed to cure pellagra, dyspepsia, indigestion, etc. Santal Pepsin Capsules was falsely claimed to be a specific for all bladder trouble, gonorrhea, gleet, inflammation of the ovaries, rheumatism, Bright's disease and a number of other conditions (Jour. A. M. A., March 20, 1920, p. 818).

Platt's Chlorides.—The Council on Pharmacy and Chemistry reports that Platt's Chlorides is inadmissible to New and Nonofficial Remedies because its composition is uncertain and indefinite, and because the claims made for it are exaggerated and misleading. The A. M. A. Chemical Laboratory analyzed a specimen purchased in 1911 and one purchased in 1919, and reports that while both contain aluminum salt and zinc chlorid, they differ considerably in composition and the latter contains a very small amount of mercuric chlorid. In the past, the advertising for Platt's Chlorides has suggested more or less directly that, as chlorinated lime (bleaching powder) may be made to give off chlorin gas which disinfects, so the air in a room may be disinfected by evaporating Platt's Chlorides. From the analysis of Platt's Chlorides it is evident that when the preparation is evaporated under ordinary conditions, only water vapor escapes. Whatever disinfecting or germicidal action the preparation may possess is exercised only when the solution is brought in direct contact with the substance to be disinfected. The aluminum and zinc salts present may be useful as deodorants, but they are not effective as germicides. The small amount

of mercuric chlorid is hardly to be considered as materially increasing its efficiency (Jour. A. M. A., March 27, 1920, p. 903).

OF GENERAL INTEREST

Dr. G. L. Baker has located at Austin.

A child welfare clinic was held March 17th in Mankato.

Dr. J. A. Schultz of Albert Lea is doing post graduate work in Chicago.

Dr. S. H. Olson of Liaca is now practicing at Colorado Springs, Col.

Dr. H. E. Richardson has been appointed deputy coroner of Hennepin county.

Dr. Albert Thompson and Dr. Harry Rowe of St. James have formed a partnership.

Dr. Willard S. Howard of St. Paul recently married Miss Edna A. Bole of St. Paul.

Dr. J. T. Asbury of Rochester has purchased the practice of Dr. C. W. Woodruff at Chatfield.

Dr. H. G. Lampson, Nopeming Sanitarium, has been appointed county health officer of St. Louis county.

Dr. J. A. Kittleson, formerly of Starbuck, Minn., is associated with Dr. Lerche at 1040 Lowry Bldg., St. Paul.

Dr. F. C. Folken of Albert Lea was elected city health officer. He succeeds Dr. E. O. Vollum, who has resigned.

Dr. L. E. Pennington has resigned from the staff at the St. Peter State Hospital and has moved to Logansport, Ind.

Dr. Harry M. E. Lewell of the Mayo Clinic has been appointed superintendent of the Mercy Hospital, Hamilton, Ohio.

Dr. Andrew Gullixson will leave Bricelyn and go to Chicago to take a postgraduate course. Later he will locate at Albert Lea.

Dr. Edward Schons has opened his offices at 348 Lowry Bldg. Dr. Schons will specialize in X-ray diagnosis and treatment.

Dr. A. G. Sanderson of Granite Falls, has been appointed resident physician for the Great Northern railway as well as War Risk Insurance physician.

The Hennepin County Tuberculosis Association succeeds the anti-tuberculosis committee of the Associated Charities. Dr. Henry L. Ulrich is president.

Dr. John Sundwall, director, University of Minnesota health service has been elected president of the National Association of College and University Health Services.

The Frazee Hospital at Frazee, Minn., has been opened by Dr. H. W. Arndt. Dr. Arndt previous to coming to Frazee was located at Paynesville for five and a half years.

The Mounds Park Sanitarium Association is now operating the Midway Hospital. The training schools of the two hospitals and the personnel as a whole is under joint management.

A site, comprising seven and one-half acres, situated on University avenue in the heart of the Midway District, has been purchased on which it is planned that as soon as building conditions have become settled a general hospital will be erected.

Dr. L. E. Baldwin, head of the University Hospital, will be named superintendent of the Charles L. Miller hospital when the new St. Paul institution is formally opened about September 1st.

Dr. Baldwin Borreson of Warren, who for the past several years has been associated with Dr. H. M. Blegen and prior to that time was connected with the Bratrud Clinic, has decided to locate in Bemidji.

The annual meeting of the physicians hospital association of Thief River Falls was held March 8th. The following were elected: President, Dr. O. F. Mellby; vice president, Dr. Jacob Biedermann; secretary, Dr. H. W. Froehlich; treasurer, Dr. A. J. Paulson.

Rochester, Minn., is the home of the oldest practicing physician in the United States, Dr. W. A. Allen, who celebrated his eighty-sixth birthday March 12. Dr. Allen was born at Pendleton, Ind., in 1834. He came to Rochester in 1872 and has practiced medicine ever since in this city and county.

Lieutenant Colonel A. J. Chesley, a Minneapolis physician now engaged in relief work in Poland, was married recently in Warsaw, Poland, to Dr. Flacida Gardner, physician and bacteriologist of Los Angeles, who served with the American Red Cross throughout the war and organized the relief corps in Warsaw.

At a recent meeting held at Oxford to consider what steps should be taken to perpetuate the memory of Sir William Osler, it was resolved that the most appropriate form of a memorial would be an Osler Institute of General Pathology and Preventive Medicine. A provisional committee of Osler's friends in America was appointed consisting of Professors Welch, Cushing, Billings, President Butler and Dr. Walter James.

Dr. Noguchi and his associate, Dr. Kligler, both of the Rockefeller Institute for Medical Research, have gone to Yucatan to study the yellow fever situation. The International Health Board of the Rockefeller Foundation is financing the project just as it did Dr. Noguchi's mission last season to Guayaquil. Further studies will be carried out to confirm the leptospira icteroides as the causative factor in this disease.

OBITUARY

DR. CHARLES J. McGUIRE

Dr. Charles J. McGuire died suddenly Feb. 26 at Altura, Minn., where he has practiced for the past several years. Dr. McGuire for several years was a resident of Minneiska. He located at Altura after

leaving Minneiska and served his country during the war. He is survived by his wife and one child, a daughter about four years of age.

DR. THOMAS LEE

Dr. Thomas Lee, aged 38, died at Washington, D. C., February 19th. Dr. Lee was the physician for the Hibbing public schools for seven years. While serving in the army he contracted an illness following which he gradually failed.

PROGRESS IN MEDICINE AND SURGERY

DELAYED SECONDARY HEMORRHAGE COMPLICATING TONSILLECTOMY: Virginius Dabney, M. D. (Annals of Otology, Rhinology and Laryngology, September, 1919. Vol. XXVIII, No. 3) A slow severence of the tonsil base and all hemorrhage controlled before the patient is taken out of the operating room is less likely to be followed by a secondary hemorrhage.

The author reports a secondary hemorrhage following ten days after operation. During a period of twelve years only four cases delayed beyond 24 hours after operation occurred; of these two were done under cocaine infiltration without adrenalin and the Mackenzie tonsillotome, the others were done under ether anesthesia and the cold snare.

It is the authors belief that the cause for these delayed secondary hemorrhages is due to the separation of a slough following much trauma; again exertion resulting in increased force in the blood stream against the walls of small blood vessels thinned at operation might cause the flow of blood. GEORGE C. DITTMAN.

INFECTION OF THE KIDNEY. Hugh Cabot (Wis. Med. Jour. Feb. 1919.) Tuberculosis of the kidney, contrary to the teachings of the pathologist, is almost universally unilateral, when the patients are seen clinically. Infection of the normal bladder is almost impossible without injury or by the artificial retention of urine. The lymphatic supply of the ureter and the blood supply are segmental in character, and it is unlikely that any infection takes place through them, as the drainage of the first part of the ureters and bladder is into the pelvis rather than up toward the hilus of the kidneys. When it does happen by direct extension, it is due to obstruction somewhere in the urinary outflow, so that there is a back wash and a reverse peristalsis, as is true in nature in any hollow viscus in which there is obstruction. In that way infection may be carried up into the pelvis of the kidney, and a pyelitis result.

Otherwise, kidney infections are almost entirely due to infections through the blood stream. He mentions the three varieties:

That due to cocci, the pyogenic variety, in which we have the cortical abscesses, either multiple, or at times, only single. These do not give very many urinary signs except probably cocci occasionally, at the height of the disease. These are also the infections which give rise to the obscure perinephritic abscesses accompanied by diaphragmatic fixation, leukocytosis and fever, and it is on these symptoms chiefly, with the presence of cocci in the catheterized urine, that Cabot makes his diagnosis.

The next that he mentions is the colon bacillus infection, which he thinks has a predilection for the wall of the renal pelvis. These cases he considers progressive, resulting finally in destruction of the kidney tissue, a good deal like a pyonephrosis. He attributes this to the loss of elasticity in the wall of the pelvis, due to thickening from the presence of the multiplying organisms. The result is that the musculature of the pelvis no longer acts, the pelvis becomes stiff and non-elastic, and the infection stays in the pelvis, to be forced upwards in its accumulation, so that it finally affects the kidney parenchyma.

The third type he describes is the overwhelming streptococcic infection, which sometimes occurs. In these cases, however, he thinks that the infection usually starts in the pelvis, but is so fulminating that it rapidly spreads up into the calices, and so on up into the tubules, causing a general necrosis of the organ. Surgery, of course, is the only treatment for these cases. He also considers surgery the only treatment for those due to pyogenic organisms, unless the cases show a tendency to spontaneous recovery.

He does not use vaccines in the colon bacillus types, and has found no benefit from their use. He is rather skeptical also about pelvic irrigations, although on account of the fact that kidney destruction eventually results, if nothing can be done, he is in favor of giving it a good fair trial, particularly in early cases. He is in favor of the use of formaldehyde, but most emphatically states that urotropine does not work unless the urine is highly acid, not even a normal acidity being sufficient. He uses litmus paper as a rough test, but carefully notes the degree of acidity shown. He gives urotropin never less than four hours apart, as it requires only five hours for the drug to be entirely eliminated by the kidneys. He also lays great stress on the supposedly sterile urine being due, in case pus is present, to either stone or tuberculosis, intimating that pus infection would show more easily the organism involved. F. J. HIRSCHBOECK.

THE CLINICAL APPLICATION OF THE CARREL DAKIN METHOD TO CASES OF ACUTE APPENDICITIS REQUIRING DRAINAGE: Surg. Gyn. Obst., Mar., 1920. E. T. Rulison, Jr., reviewed 263 cases of appendicitis which were drained and found that in 38 per cent of the cases the important tissues of the abdominal wall were not preserved in a sat-

isfactory manner. Namely, an extension contamination of the operative wound occurs following appendectomy and drainage of a peritoneal abscess. In these cases the average treatment was 28 days, fecal fistula developed in 7.5 per cent of the cases and the mortality was 9.1 per cent.

The purpose of the authors technique is to prevent if possible the destruction of the tissues of the abdominal wall and his results are based on eighteen cases of his own A detailed description of the method is given, the arrangement of the drainage tubes being of greatest importance. The reviewer will not give the details of the method but feels that the results of the method in the eighteen cases are more worthy of study. In the eighteen cases there was no case of secondary hemorrhage or fecal fistula; there was but one case of residual abscess which emptied itself spontaneously through the drainage tract. In one case mechanical ileus occurred which the author regarded as being the result of tube pressure. Two pulmonary complications in the series occurred; one, an acute bronchitis and the other a probable pulmonary embolism which terminated fatally and which did not come to autopsy. The average time in the hospital was 24.1 days. The condition of the wounds on discharge was as follows: healed, 2; healed with clean crust, 2; small granulating areas flush with skin surface, 6; large granulating area, 1; with shallow sinus, 6. One case was discharged with a weak abdominal wall—the case of mechanical ileus which had to be reoperated upon. The anatomical results were excellent in twelve cases; there was a slight bulging in one case at six months and a diffuse bulge at two months in a child; there were two hernias, one small and one large, the latter "occurring in a case not Dakinized throughout". The reviewer feels that the results in this series of cases hardly justifies the rather tedious and meddlesome method described by the author. He regards the parting sentence of the article as significant. "If one is not willing to give the time necessary to gain a correct theoretical understanding and is not willing to give the cases his careful, personal attention at daily dressing the method should not be employed as it will probably not only prove disappointing but may result in serious complications."

GEORGE GEIST.

OPERATION FOR ADVANCED CARCINOMA OF THE TONGUE OR FLOOR OF THE MOUTH: Vilray Papin Blair, M. D., (Surg. Gyn. and Ob., Vol. 30, No. 2) quotes Lenthal Cheatle who concluded from his histological studies of advanced cases that extensive involvement of the associated muscles was the rule in the cases he examined, and therefore that the intrinsic and geniohyoglossus muscles should be removed in all cases.

It is the author's belief that the operation described is properly applicable to the more advanced cases especially those that also involve the jaw, the floor of the mouth or the base of the tongue, or those with palpable involvement of the submaxillary nodes, and to early cases where, after removal by a less radical procedure, examination reveals a high grade malignancy. It consists in the block removal of the tongue, the structures in the floor of the mouth, all muscles above the body of the hyoid bone and stylohyoid muscles, the submaxillary and submental lymph nodes and as much of the faucial pillars and pharynx as desired, together with thorough cauterization of the mandible wherever the ulcer approaches or involves it.

A low bloodless tracheotomy is done preferably under a local anaesthetic. The tracheotomy precedes the main operation by a day or more. No attempt is made to clean up the inside of the mouth before operation; a person in ordinary health has some immunity to the organisms he habitually carries but trauma may destroy this immunity.

The skin incision skirts the lower border of the hyoid bone and goes just through the platysma muscle, extending from ear to ear. The blood supply is controlled by ligation of the facial artery and its branches, and ligating the facial vein. The lingual artery is also exposed and ligated. In the dissection the facial artery stumps project freely into the pharynx. This is considered safer than to bury them in the infected tissues. The importance of handling the blood supply is realized by all who have had any experience in operating on cancer of the tongue.

The blood supply being now controlled, the excision is made with a cutting cautery starting at the symphysis and cutting through the digastrics, geniohyoids, geniohyogolossi and myohyoid muscles, stripping the periosteum and mucoperiosteum from the inner surface of the jaw. If the ulcer approaches the bone, prolonged cooking with a heavy cautery is done. The tongue is next drawn out through this opening which brings the pillars and the pharynx into plain view, the excision here being guided by the position and extent of the growth. Finally the base of the tongue is cut across right at the hyoid bone and it is well also at this time to remove the lower part of each parotid gland on account of the closely associated lymph nodes.

GEORGE EARL.

THE EYE IN PREGNANCY: Luther C. Peter, (N. Y. Med. Jour., Jan. 24, 1920) regards the eye changes which take place during pregnancy as a valuable guide to the future handling of any individual case.

Toxemia of pregnancy may be a disease brought on by pregnancy itself, or it may be an exacerbation of a chronic interstitial nephritis. Since the eye is one of the most definite and reliable indicators of the progress of the latter condition, its careful study during pregnancy will give much information.

If the case is one of exacerbation of the chronic

condition, we find the usual eye symptoms of kidney chronicity, such as hemorrhage, retinal edema or detachment, and the characteristic white stellate areas. If these ocular changes are found during pregnancy, they call for the immediate termination of pregnancy regardless of its stage. To temporize would court disaster.

If, to the above signs of chronicity, are added the signs of acute toxemia, such as diffuse retinal edema, massive hemorrhages, neuro-retinitis, and swelling of the disc, a rapidly fatal termination is about the only prognosis.

A carefully studied blood pressure will invariably show a rise which is quite parallel with the increasing eye symptoms. "In fact the eye phenomena are caused by the arterial hypertension."

The second type includes those cases superinduced by pregnancy and here the eye symptoms may be as easily interpreted although not as pronounced, nor calling for as radical treatment. Elevation of blood pressure is present but not as marked. While hemorrhage may be absent, edema is present in the retina, specially when there is blurring of vision, together with other evidences of a toxic process. As in the chronic type, the interior of the eye again furnishes a fair index to the severity of the general toxemia.

The treatment, when milder symptoms only are present, depends on the stage of pregnancy, together with the blood pressure and the urinalysis. Experience has shown that many of these cases will go to full term, recover from the kidney condition and pass through succeeding pregnancies without a return of the trouble. An intelligent prognosis can be arrived at only after careful study of the blood pressure, urine and eye symptoms.

If the mild eye conditions only are present with only a moderate increase of blood pressure, eliminative treatment is indicated and may suffice. The three indicators (blood pressure, urine and eye) should be routinely watched, and changes in blood pressure and eye, indicating an increasing toxemia, should dictate the treatment.

In case uremic blindness develops suddenly, even though without convulsions, and hysteria can be ruled out, radical treatment should be inaugurated as the usual result is permanent injury to the eye.

Eye studies should be part of the routine prenatal care, as changes in that organ may be so insidious in onset that the patient may be wholly unaware of any change taking place.

The evidence of greatest value in determining the course of treatment is furnished by a careful and repeated examination of the eye. Puffiness of the eye lid, dimness of vision and chemosis should not be ignored. ALBERT G. SCHULZE.

PUERPERAL INFECTION; A PLEA FOR EARLY OPERATION IN PELVIC SEPTIC PHLEBITIS. Nyulasy (Surg. Gyn. & O. B. Vol. 30, No. 3) points out that the erroneous causes of death so frequently alleged in puerperal infection may represent mistakes in diagnosis but are often due to the medical attendant realizing that a frank admission of puerperal infection may leave him open to the charge of having left something behind, or having been unclean in his work. There may be no foundation for such charges, all aseptic care having been used, and not a particle of placenta being retained; on the other hand the most scrupulously careful examination may fail to discover whether a freshly delivered placenta is absolutely complete.

The writer calls attention to the disease which Virchow named polypoid decidual endometritis. Polypoid decidual endometritis was first mentioned by Virchow in 1861 in connection with a three months abortion in which he found polypoid outgrowths of the decidua suggestive of condylomata. In 1908 Frank Nyulasy showed that the disease is a relatively common complication of pregnancy, and is not seldom met with after full time labor; a fact of high importance, since, although the placenta may be expelled complete, the patient may nevertheless die of puerperal infection dependent on the polypoid placenta. It was also mentioned that polypoid decidual endometritis is an interstitial inflammation of the decidua and partly of the underlying muscle. The disease is a common cause of abortion and of adherent placenta.

Pelvic Septic Phlebitis is the cause of 30 to 50 per cent of deaths from puerperal infection.

In a patient with puerperal infection fundamentally connected with the interior of the uterus, as is most commonly the case, the relative frequency of polypoid decidual endometritis as a complication of pregnancy and the marked vulnerability of the involved decidua to infection should be borne in mind. Subinvolution, which is always a feature of polypoid decidual endometritis indicates urgent need for examination of the uterus. In a case of puerperal infection in which the uterus is cleared of any polypoid decidua and of any adherent placenta and examination has failed to disclose any gross extra uterine lesion in the pelvis or elsewhere, the patient will sometimes continue to deteriorate from the infection. Here the diagnosis of pelvic septic phlebitis becomes largely a matter of exclusion. If no pelvic lesion can be recognized and no other septic focus can be discovered the author thinks he is justified in assuming the existence of pelvic septic phlebitis. The presence of localizing pain, rigors, or of femoral phlebitis would strengthen the diagnosis. In the cases that have come under the author's obsevation the thrombosed veins could not as a rule be palpated, so that in such circumstances progressive deterioration is the only really safe indication to follow. Having then provisionally diagnosed thrombophlebitis, operation should be carried out without delay.

The operation most commonly consists of excision of ovarion veins and, less frequently, ligature

of the internal illiac vein. The author believes that many cases of puerperal infection can be saved by early operation that would die if treated on the lines hitherto followed. E. M. Jones.

TONSILLECTOMY UNDER LOCAL ANESTHESIA: George B. Jobson, M. D. (An. of Otol. Rhin. and Laryng, Sept., 1919. Vol. 28, No. 3) after an experience with 325 tonsillectomies operated upon under local anesthesia, concludes that it is the method of choice in adult cases and in many selective cases in children over 12 years of age.

The ages of cases operated upon by local anesthesia ranged from 8 years to 55 years; the loss of blood in no case was over 2 ounces, the majority being bloodless; no case of secondary hemorrhage occurred; 75 per cent of the cases complained of no pain; others of slight pain during compression of snare; convalesence was shorter than with a general anesthesia.

As the author states the main factor in a bloodless and painless operation is the injection of the anesthesia.

Blood coagulum is tested. If above normal calcium lactate gr. 15, t. i. d. is given for a period of three days. Hemophiliacs should be rejected. During menstrution and acute inflammation of tonsils the operation is not performed.

Half an hour before operation 1/6 gr. morphine and 1/150 gr. atropine are given. Three or four applications of 8 per cent solution of cocaine are made on the tonsils, pharynx, soft palate and base of the tongue at intervals of three minutes. The tongue is depressed with a Pynchon depressor, the tonsil is grasped with forceps and drawn firmly toward the median line raising the gland from its bed and making the pillars taut. The space between the tonsil and superior constrictor is flooded with 2 to 3 drams of 0.5 of 1 per cent solution of novocaine to which is added a few drops of 1-1000 adrenalin solution. This flooding forces the tonsil from the superior constrictor and away from the tonsillar, ascending and decending palatinal arteries. This hydraulic dissection lessens the danger of cutting large vessels and many nerve branches entering the tonsil are blocked off.

The technic of injection is to insert a long needle through the base of the taut anterior pillar, injecting the solution behind the tonsil. Three injections are likewise made from the lower to the upper end of the anterior pillar and a few drops are injected into the peritonsillar fossa. Ten minutes are allowed for the anesthesia to act. The tonsil is then grasped and drawn toward the median line. The plica is separated at the upper third of the tonsil with a Day tonsil knife; the incision is prolonged into the anterior tonsillar fossa and continued down to the inferior pole; the knife is reversed and the original incision carried to the posterior part of the supratonsillar fossa. The posterior pillar should not be separated with a knife or dissector as the snare will peal the tonsil from its bed.

After freeing the tonsil a No. 8 snare wire is slipped over the locked forceps and with a quick pressure the tonsil is enucleated. The tonsillar fossa is swabbed with glycerite of tannin; the patient is returned to the room, propped up in bed and given pellets of ice to suck for the after pain.

George C. Dittman.

APPLICATION OF PURE COCAINE FOR NASAL ANESTHESIA: A. H. Andrews, M. D. (Ill. Med. Jour.—Jan., 1920). In using this method of anesthesia the author first applies cotton saturated with 1-1000 to 1-5000 solution of adrenalin, allowing these plegets to remain in position five to eight minutes. An applicator tipped with cotton is moistened with adrenalin solution or water any excess being squeezed out, this dampened pleget is then dipped into powdered or flaked cocain, the area to be anesthesized is rubbed with this small amount of cocain. If greater anesthesia is desired a second application is made after two or three mintes. Anesthesia is sufficient after the second application to make examination or begin operation. About ¼ to ½ grain of flaked cocain is necessary for the anesthesia in a submucous resection. The advantages claimed are: it is safer than cocain solution; by contracting the blood vessels the cocaine absorption is limited; it is prompt, profound and lasting; the amount of cocaine required is safe and economical.

George C. Dittman.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

Education in War and Peace. Paxton. Paul B. Hoeber, 1920. $1.50.

Manual of Nursing Procedure. Pope. G. P. Putnam's Son, 1919. $2.40.

Surgical Clinics of Chicago. Feb., 1920, Vol. 4, No. 1. W. B. Saunders Co.

Medical Clinics of North America. Jan., 1920, Vol. 3, No. 4. W. B. Saunders Co.

Diseases of Infants and Children. Griffith. W. B. Saunders Co. Vols. 1 and 2. $16.00.

Physical Diagnosis. Da Costa. W. B. Saunders Co. 4th edition, 1919. $4.75.

Modern Surgery. Da Costa. W. B. Saunders Co. 8th edition. $8.00.

Orthopedic and Reconstruction Surgery. Albee. W. B. Saunders Co. $11.00.

SURGICAL CLINICS OF CHICAGO, December, 1919. Vol. 3, No. 6. W. B. Saunders Co.

This volume of the Surgical Clinics of Chicago shows some very interesting cases, both as regards diagnosis and technique of handling them. Dr. Daniel A. Orth demonstrated how to care for these neglected cases of carcinoma of the breast with the x-ray, radium and actual cautery. The electro cautery knife is used to do the dissecting and is heated to a "white" heat to make the incisions, and to a "red" heat to do the dissection of the axilla.

Eisendrath and Goodkind have a very instructive discussion on Subacute Pancreatitis. They quote Archibald as stating that the pancreas is rarely the seat of bacterial inflammation. Cultures from all but frank abscesses (which are rare), are usually sterile, and even from some of these abscesses the cultures produce no growth. In the etiology of the condition the most important sources are.

1st. Infections from the biliary tract. This is the theory of Maugeret, Arnsperger and Deaver. The infection travels according to this view by the lymphatics. Archibald does not believe in this retrograde route because the pancreas is rarely the seat of bacterial inflammation, as the cultures are negative.

2nd. Hematogenous Route. This theory is held by those who believe that Pancreatitis occurring during mumps, typhoid, etc., can be explained on this basis.

3rd. The necrosis is the result of direct action of the bile salts, and it is not necessary to assume an activation of the normal pancreatic ferments. This is the theory of Opie, Flexner and Archibald. It is of interest in connection with this theory that three conditions must be present before actual damage will be done —first a change in the bile, whereby there is an increase in bile salts,—second undue resistance at the ampulla,—and third a rise in the bile pressure.

There are a number of other articles which everyone would be interested in reading.

The volume also contains the index for volume III.

W. C. Carroll.

MODERN SURGERY. J. C. DaCosta, Eighth Edition. W. B. Saunders Co. $8.00.

DaCosta in his eighth edition of his Modern Surgery brings his previously very valued work up to date by incorporating in it the latest in war surgery. This work was revised under very adverse circumstances. His associates and assistants on whom he depended so much for help in his previous edition were away at war, and it was certainly a monumental task to sort over the many and varied articles on war surgery. The newer methods of treating compound fractures, skull injuries and wounds of the chest are well taken care of, and the charter on tetanus and infections is well worth reading.

In speaking of some of the newer methods of treatment which have been put forth he says. "Every now and then we see a claim to a discovery of a new thing which turns out to be only a scientific egg from cold storage being offered for sale as new."

The vast bulk of the work is very similar to the previous edition, and should maintain the same popularity.

W. C. Carroll.

PRACTICAL ORGANOTHERAPY (The internal secretions in general practice) by Henry R. Harrower, M. D., F. R. S. M. (Lond.) Glendale, Cal. 1920.

The author, a pioneer in this study in the United States, has already published two other volumes on the subject.

The recent volume, being intended for practical use, does not expatiate in theoretical discussions, but gives a clear outline of the endocrine diseases, as known so far, with a thorough classification of the various endocrine preparations.

The book ends with the indication—in the different cases—of the reliable pluriglandular preparations, which Dr. Harrower himself has put on the market.

G. Vercellini.

SYPHILIS. HAZEN. C. V. Mosby and Company. $6.

Skillfully collaborated, profusely annotated and wonderfully illustrated the work of Hazen and associated authors deserves a place in every medical library.

If one may single out any certain portions of the work for comment the chapter on the Pathology of Syphilis and that on Syphilis of the Vascular System are particularly interesting. Much more so than the average text-book.

The workmanship of the book is exceptionally good; the printing is clear, which makes the book easily read; for all of this the publishers are to be commended.

E. Gager.

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ORIGINAL ARTICLES

THE DIAGNOSIS OF CARDIAC DISEASE*

By JAS. S. GILFILLAN, M. D.
St. Paul, Minn.

The reason for presenting to you today a paper which you will find contains nothing new, is that even today the subject of abnormal sounds heard over the cardiac region appears too seldom to be the subject of critical study. How often we see patients in whom the discovery of an accidental murmur has lead to the diagnosis of chronic endocarditis, and, as this is especially apt to occur during childhood, activity has been limited and perhaps a chosen vocation abandoned for fear of overtaxing a crippled heart. How frequently men have been unable to obtain life insurance or have been rejected during examination for the army when the murmur heard over the heart had really no significance.

It may repay us first to review briefly the physics of murmurs. Much has been written on this subject, but so long ago that it has been almost forgotten.

The acoustic peculiarities of cardiac murmurs correspond completely to those sounds which can be produced by the flow of fluids in tubes. If water flows through a glass tube, there is no sound until a certain rapidity of flow is reached when a blowing murmur is heard. Thus one factor is rapidity of flow. If to such a tube one of larger or smaller caliber is joined, or if a constriction or dilatation is provided a similar murmur occurs at a rate of flow which is without sound in the tube of uniform caliber. A second factor then is alteration of the lumen. Roughening of the inner wall of the tube would act as multiple small stenosis.

*Presented before the Southern Minnesota Medical Association, Dec. 1919, Mankato.

It has also been determined experimentally that murmurs are more readily produced when the wall is thin, flexible and distensible and that the less viscous the fluid the more easily the sound is produced. The pressure has but little influence.

It was formerly thought that the sound arose in the fluid itself, being caused by vortices. However, liquids give rise to sound with great difficulty and only under peculiar circumstances, which, as Fick has pointed out, are never present in the animal body. The sound then is not due to vortices although these are present when sound is produced, or to the internal friction of the liquid, as murmurs are more easily produced when the internal friction is less. The sound is caused by vibration in the wall of the tube, or in the heart by vibration of the valves or heart wall.

Krehl says "Murmurs originate from peculiar movements of the blood and are the direct result of the vibration of membranes. So the vessel wall has been compared to a violin string, the moving blood to the bow.

Valvular murmurs, then, arise as the blood stream, either during systole or diastole, passes through an opening which is narrow compared to the neighboring cavities. For every grade of constriction a certain minimum rapidity of flow is necessary for the production of the murmur. So valvular lesions may be present without murmur, or the murmur may only be heard when the rate of blood flow is increased. The character or intensity of a murmur does not indicate the extent of the lesion. For a fixed rate of flow a certain degree of constriction is necessary to produce the loudest sound. The intensity then would diminish if the constriction were either greater or less than the optimum.

It will be seen that all the conditions for the production of murmurs are present in the normal heart and, as Sahli says, the astonishing

thing is that as a rule no murmur is present. This must be due to the fact that the rate of flow is insufficient, with a fluid as viscid as the blood, to produce sound.

The above considerations make it easy to account for those murmurs due to valvular lesions, but frequently murmurs are heard over the normal heart and these accidental murmurs have never been explained in any very satisfactory way. We may discuss briefly several of the many theories concerning their origin, as they are at least of interest. I think it quite possible that the sounds may arise from different causes, so that each theory may contain some truth.

These accidental murmurs are nearly always systolic in time, although diastolic accidental murmurs may occur in very severe anaemia. They do not differ in character from those due to organic lesions.

Sahli thinks that they are due to an increase in the velocity of blood flow in the heart and great vessels. This may be brought about either by the quicker contraction of the ventricle or to an increase in the amount of blood expelled on systole, that is, an increased diastolic filling. This theory has much in its favor. First, we have seen that under the conditions present in the heart a sufficient velocity would give rise to a murmur. Again, such murmurs if not constant, are often present in conditions where the velocity is increased, for instance in fever, anaemia and after exercise.

In rabbits, following the administration of small doses of adrenalin there is a great increase in the strength of the heart action and a slowing of the rate. Often a loud systolic murmurs develops. In fact, in these animals, anything increasing blood rapidity may pro duce a murmur. The reason for the absence of murmurs during diastole would be that the difference in caliber between the large veins and auricles and between the auricles and ventricles is much less than that between the ventricle and aorta or pulmonary artery. The blood velocity is also less.

Another explanation of these murmurs is adopted by Luethje. He found a systolic murmur very common in childhood. It was present at rest in most of the cases, in a minority it was only brought out by exercise. It was most frequent between the ages of ten and fourteen years, the period of the greatest growth in the length of the body and when the thorax is comparitively more shallow than earlier or later in life. The murmur, moreover, was more common in those individuals with flat than in those with arched chests. It was heard only over the pulmonary area or was loudest there, and was much diminished in intensity and disappeared on inspiration. That is, the murmur was apparently influenced by the space relations within the thorax, and he thinks it most easily explained by assuming a relative stenosis of the pulmonic orifice. Romberg says that in childhood the pulmonary artery is wide relative to the ostium and Luethje thinks that the difference in caliber is at the critical point, when a slight alteration due to pressure is sufficient to produce the murmur. In some cases in children the murmur can be produced by strong pressure with the stethoscope.

A third theory of the nature of accidental murmurs is that of Potain, later adopted by H. Muller. Potain says that they cannot be caused by anemia, by functional insufficieney, altered pressure or velocity, in fact that they cannot originate within the heart and consequently must arise in the lung. He believed the systolic murmur due to the aspiration of air into that portion of the lung adjacent to the heart on systole, the heart receding from the chest wall and exerting a suction action on the lung. The difference in the character of the sound compared to the normal breath sound is due to the greater filling rapidity. Muller thought the lung compressed during systole and the sound due to expulsion of air. Others claim that the lung is pushed aside without compression and that there can be no localized streaming of air in the lung.

Potain and Muller believed that the fact that these murmurs became fainter or disappeared on deep inspiration showed them to be of pulmonary origin and that such variations would not take place if they arose within the heart. In all probability some accidental murmurs are cardio-pulmonary, but few go as far as Potain and Muller in applying this theory. Sahli says that occasionally this may be the cause, while Romberg says Potain goes too far

in claiming all accidental murmurs to be of such origin.

These accidental murmurs cannot be differentiated from organic by their character so that we may say that, in the case of a systolic murmur, the diagnosis of an organic lesion must depend on other evidence of cardiac disorder. This is the point so often misunderstood.

We may now consider the effects of respiration and position on the intensity of murmurs, and some of the methods of bringing out a murmur which under certain conditions may not be audible. Muller says that all murmurs absent during rest and only heard after exertion, and those heard only on lying or standing are surely accidental, but this is certainly incorrect, and it is often a great help in diagnosis to be able to demonstrate a murmur.

The various methods adopted for this purpose have, as a rule, for their object the increase in the velocity of the blood stream, although in some cases the mechanism is difficult to understand.

It is well known that some murmurs are heard only in the recumbent, others only in the erect position. This applies to accidental murmurs and to those due to valvular disease. The respiration has also considerable influence on the intensity of these sounds. This is due partly to the varying amount of lung covering the heart, partly to the influence of respiration on the flow of blood within the heart and perhaps partly to other effects in the case of accidental murmurs, as believed by Luethje and Muller.

On inspiration the flow of blood into and from the right heart is increased. If inspiration is rapid the flow to and consequently from the left heart is slowed on account of the increased capacity of the pulmonary vessels. On slow deep respiration this effect is overcome in the latter part of inspiration and the flow increased. The conditions on expiration are exactly reversed—Valsalva's procedure slows the stream in both sides of the heart, after a momentary acceleration in the left. This alteration in the velocity of blood flow during different phases of respiration may at times be of use in locating a lesion in the right or left heart. The Valsalva experiment may be applied in the differentiation of endocardial and pericardial sounds, the former being lessened in intensity or obliterated, the latter usually increased.

As diastolic murmurs nearly always indicate organic disease, their demonstration is of particular importance. Recently several articles have appeared which have to do with the demonstration of the murmurs of aortic regurgitation and mitral stenosis in cases in which they are absent under ordinary conditions.

Regarding aortic regurgitation, it has been found that in certain cases the murmur is not heard through the stethoscope although audible when the ear is placed on the chest. Personally I have not seen such a case. Pardee shows that the recumbent position is unfavorable and that the murmur is best heard after exercise in the erect position or with the body inclined forward.

Mitral stenosis is the lesion in which the murmur is most frequently absent. Fortunately in most cases the character of the first sound attracts attention and leads us to expect the condition. Here also the murmur is best heard after exercise, but in the recumbent position, on the left side or prone. I have seen cases in which no trace of a murmur could be heard until the left lateral position was assumed, when it at once appeared.

The lesson which this somewhat desultory dissertation is intended to convey, is, in the first place, not to place too much dependence on a systolic murmur in the diagnosis of a valvular lesion, but to demand other evidence, and when a lesion is suspected, to search for the confirming murmur at different times and under various conditions. The necessity of the lesson I think has been emphasized by our late experience with candidates for the army.

DISCUSSION

DR. C. P. ROBBINS, Winona: The paper presented by Dr. Gilfillan is a very instructive and interesting one and emphasizes certain facts regarding the diagnosis of heart diseases. When we stop to consider that out of the first draft of two and a half million soldiers, 29 per cent were rejected for physical defects, and out of this percentage 13 per cent were due to cardiovacular diseases this fact itself shows us its importance.

Two factors are essential in arriving at a correct diagnosis of cardiac diseases. First, a routine

method of examination, and second, some classification of heart diseases. In the latter we divide them into functional and organic diseases.

The organic diseases we group according to some etiological factor such as those due to rheumatism, syphilis, nephritis, and arteriosclerosis.

Those due to rheumatic conditions usually begin with mitral insufficiency, and we look for some focal infection. Those due to syphilitic conditions usually affect the aortic valve or the myocardium and we have the Wassermann test. In nephritic conditions the heart may be murmurless but we have highblood pressure, and the urinary findings.

Those due to artiosclerotic conditions are part and parcel of an affection of the general system. They have local manifestations either cardiopathic, nephritic or tabetic. We know they are due to a local irritant floating in the blood current, and that irritant is due to a toxic protein.

The functional disturbances we have to deal with are the arrythmias,—extrasystole, auricular fibrillation, auricular flutter, pulsus alternans, heart block, and paroxysmal tachycardia. These cases we have to study with a polygraph, and they are due to nervous disturbances in the heart muscle.

The routine method of examining the heart which includes general inspection, pulse, sounds, shape of the heart, are essential in arriving at a correct diagnosis.

The general inspection of the body as to build, stature, gait, the color of the skin as to cyanosis, oedema, palor, flushings, dry or moist skin, the objective findings in the eye, the pupulary reflexis, the color of the lips, cheeks, the playing of the aliae of the nose, the condition of the mouth, teeth, tonsils, the scars on the neck, enlarged glands, pulsations of the blood vessels of the neck, the size, shape and conformity of the chest, the location of the apex beat all are essential.

The pulse should be studied as to rate, rhythm and quality. In mitral stenosis we have an empty pulse, a low tension and small pulse. Mitral insufficiency does not modify the pulse to a great extent. In aortic insufficiency we have the water-hammer pulse, the pulse that caves in under the finger. In aortic stenosis we have a slow, small pulse. In myocardial cases we have two types of cases, those due to degeneration of the coronary arteries in which there is bradycardia, and the other group classified under myodegeneratio cordis and toxic myocarditis wherein we have a rapid pulse or tachycardia. All myocardial pulses agree in this respect; they show arrythmia and inequality and are too fast or too slow. By using the pulse pressure divided by the diastolic pressure we find the heart load in myocarditis, which normally is about 50. In distinguishing dilatation from hypertrophy the pulse in the former is a soft pulse, with low tension, while the reverse is true of the later.

The heart sounds are as essential as the murmurs. In mitral insufficiency we have a marked accentuation of the second pulmonic sound, and in mitral stenosis there is a marked accentuation of the first apicial sound. In aortic stenosis we have the load sawing systolic murmur with the absence of the second sound, while in aortic insufficiency the diastolic murmur over the aortic area is transmitted down to the left with a little change in the sound.

The shape of the heart is of importance in diagnosticating heart diseases. In mitral stenosis the heart is enlarged to the right. The heart of mitral insufficiency enlarges mostly to the left. Both of these hearts after they have existed for a while lead to dilatation of both ventricles and so spreading of the heart laterally both right and left results. In aortic insufficiency the heart lengthens and the apex drops in the sixth or seventh interspace, so the heart is enlarged vertically. The same is true in less degree in aortic stenosis. In arterioclerosis and nephritis the heart is chiefly enlarged in the left ventricle. Hence the importance of the shape of the heart.

To recapitulate: the general inspection, the pulse, heart sounds, and the shape of the heart, together with grouping of heart diseases from an etiological standpoint, are essential in the diagnosis of diseases of the heart.

DR. CHARLES L. GREENE, St. Paul: As I listened to Dr. Gilfillan's opening remarks, it was suggested to me in case I should discuss the paper, that it is a pity we cannot forget heart murmurs. I think in the past we have devoted far too much attention to the murmur and far too little to the myocardium.

In the many years of my teaching students, have found it very fascinating, yet a difficult task, to teach them the valvular lesions of the heart without too greatly emphasizing the importance of those conditions in the complex. We devote the major part of our time to a discussion of heart murmurs. They are extremely interesting, important, and, for the most part, readily learned. They are very simple so far as their detection and their placing are concerned. The same statement, however, cannot be made of myocardial lesions. I shall have to take issue with Dr. Robbins, if I understood one of the statements he just made, that the pulse of myocardial degeneration is arrythmic. I think I so understood him. As a matter of fact, the pulse of cases of myocardial degeneration I think can be absolutely indistinguishable from a normal pulse in many instances, and I should say it was rather in the exceptional cases that we would find arrythmias. In this field especially we must reach a greater degree of perfection in the matter of early diagnosis, and that we are not yet doing, and that we cannot do until we direct our attention, not so much to murmurs or to gross changes in cardiac outline, but to the lesser signs of a diminished cardiac reserve.

We owe to Mackenzie, especially, the placing of

emphasis upon the subjective signs of heart disease, and I trust in our teaching and in our practical work each month and each year we all will find, as I have found, that the greatest possible value lies in a proper interpretation of the sensations of the patient with respect to the detection of myocardial changes and interference with myocardial reserve.

I want to say just a word or two about the so-called accidental and functional murmurs. It is quite evident from Dr. Gilfillan's statement that we are just as much in the air today ar regards these as we ever were. There is no doubt that the systolic murmurs so frequently heard in the pulmonary area may properly be called, accidental, and these murmurs can be explained very frequently on two grounds, one a diminished tonus in the heart muscle, and probably in the pulmonary artery. The other question is one of anemia. Where there is pronounced anemia you have all factors necessary to the production of a murmur especially prominent in this particular area. You have a greatly increased rapidity of blood flow, a lessened viscosity of the blood and diminished myocardial and arterial tonus. With respect, however, to the so-called "accidental" murmurs at the apex, I feel that the more emphasis we lay upon their supposed prevalence, the greater the danger we are in of overlooking true relative insufficiency due to serious myocardial disease and an actual failure of the valves to do their work.

DR. J. W. BELL, Minneapolis: Doctor Gilfillan is entitled to our gratitude for presenting in the clear and precise manner he has the interesting subject of cardiac murmur.

I agree with Doctor Greene that in the last analysis the myocardium is the part of the heart demanding the most serious consideration. In the investigation of the heart a murmur will often direct us in the right direction, consequently we should not minimize its diagnostic value. It is well to remember that the murmur is the one thing which attracts the attention of the practitioner and it will continue to do so in spite of all opposition.

DR. GILFILLAN (closing the discussion): I think the points I made in my paper were very well covered by Dr. Greene's discussion. The idea I tried to bring out was that a murmur did not make so much difference, but I think it does make a difference. For instance, a person with a murmur indicating mitral stenosis or aortic regurgitation may not be sick enough to need any treatment, yet he will probably need some direction as to his course of life, because we know that, while the heart may be competent at the time of the examination, it is a dangerous condition; it is a heart which is apt to break down, so that the patient needs the direction of the physician, although he may not need any medical treatment.

About the teaching of our medical students, it is something I have been thinking of a good deal. We devote a good deal of time in the hospital to looking up cases of mitral stenosis, mitral regurgitation, and aortic insufficiency. It would be an important thing to teach medical students that all hearts with murmurs do not need medicine; that these patients are not all sick; not all of them have valvular lesions to account for the murmurs. As Dr. Greene pointed out, a murmur over the apex may indicate myocardial trouble. That is true. Allbutt says that whenever he hears a murmur located over the apex it is indicative of mitral regurgitation, either permanent or temporary, whereas others consider it purely an accidental murmur. Of course, Mackenzie's teaching of the value of subjective symptoms in cardiac disease is very important, and I do not think any patient with cardiac disease ought to be treated who has not subjective symptoms. A patient with incompetency of the heart will manifest subjective symptoms, and unless he has these, he has not heart disease that demands treatment.

Digitalis is not good for a heart murmur. Until we get subjective symptoms indicative of insufficiency of the cardiac muscle, no medical treatment is needed.

RADIUM-X-RAY THERAPY OF CARCINOMA UTERI AND UTERINE BLEEDING*

FRANK S. BISSELL, M. D.
Minneapolis, Minn.

As aids essential to any rational attempt to combat or palliate malignant disease in its various manifestations, radium and the reontgen rays are now universally accepted. And in certain of these manifestations, an increasing number of surgeons and radiologists are advocating the substitution of these agents for surgical procedure. Such a tendency is especially marked in discussions of the treatment of cancer of the cervix. This is because the operative treatment of this disease, carefully considered from a statistical standpoint is far from satisfactory. First, the percentage of cases considered operable is low, and there appears to be a direct ratio between the percentages of reported operability and mortality. Immediate mortality is high except in the hands of the most experienced abdominal surgeons, and even Wertheim's first one hundred cases showed an operative mortality of thirty per cent.

A summing up of available statistics would seem to show that of each one hundred cases

*Read before St. Louis County Medical Society of Duluth, Minn., Feb. 12, 1920.

presenting themselves to a conservative surgeon, from twenty-five to fifty would be accepted for operation; that of this number from twenty to forty would survive the operation; that of this remaining number from eight to sixteen (von Rosthorn) would suffer post-operative sequellae, such as ureteral and bladder fistulae, often causing more suffering than the cancer itself. We would then have from twelve to twenty-four cases in which the operation could be considered suceessful, and of these from thirty to sixty per cent would be well after five years. And it must be borne in mind that the statistics upon which these figures are based are those of the most skilled operators. It must be admitted that a method of treatment which offers a clinical cure to bnt 3% (minimum) or 10% (maximum) of patients presenting themselves, and which must contend with so high an immediate mortality and so many disagreeable sequellae has but little to justify its continued employment.

Let us now consider the other horn of the dilemma, radiation therapy. Here all cases may be treated, as the indications are equally definite, whether the disease is incipient or advanced. There is no operative mortality. The local disease may be controlled and eradicated as surely as with the knife or cautery, while metastases can be attacked and, at least, held in abeyance for a variable length of time. There are two reasons why it is not profitable to consider radiation therapy from a statistical stand-point: first, its general employment is too recent for a sufficient number of cases to have accumulated; and second, the technic of application of either radium or roentgen rays is still in process of development, and results vary widely in different hands. Yet one may find in the literature reports of a considerable number of cases of advanced carcinoma of the cervix which have remained well five years after symptomatic cure under radiation therapy. And if these results ean even occasionally be obtained in so-called inoperable cases, may we not reasonably expect mueh better statistics than have ever been shown, when all cases of cancer of the eervix are efficiently treated by means of radium and the roentgen rays?

In the more advanced, relatively hopeless cases combined radiation has certain very definite advantages over surgery. Without discomfort or shock to the patient, the debilitating foul discharge and bleeding is immediately stopped, and local healing takes plaee. The patient regains her strength, hope revives, and for a period varying from a few months to several years she may be symptom-free. In the mean time, metastatic foci in the pelvie lymph nodes or elsewhere are systematieally attaeked by massive doses of deeply penetrating and highly filtered x-rays, with the object in view of preventing proliferation and thereby arresting the progress of the disease. If this purpose fails of complete attainment and the patient eventually dies of cancer, the death is usually rapid and relatively painless, free from many of the disagreeable features of post-operative cancer deaths.

The practice of combining surgical proeedure with radiation therapy has been the one most generally followed in reeent years, and perhaps time alone will tell whether it affords end results as satisfactory as those of radiation alone. But if both methods are to be employed, their relation to each other must be definitely determined and the function whieh each is to perform must be equally well defined.

In many cases, especially of the more advanced type pre-operative treatment may be indicated if surgery has been determined upon. The local employment of radium and a full course of roentgen therapy will render the disease temporarily non-progressive and will only delay operation about three weeks. It would seem that the advantage of dealing with an arrested process is the same here as in appendicitis where every surgeon reeognizes the greater risk of operating during as active phase of the disease. Likewise the possibility of establishing an open eavity into which the radium may be carried after the operation, is one which should always receive consideration. In caneer of the uterus this can best be aeeomplished through the vagina but it is a point often neglected by the surgeon who is prone to allow the cavity to elose, before referring the case to the radiologist. Sinee the intensity

of the radiation varies inversely as the square of the distance, the immense advantage of an open approach to the seat of the disease process, is self-apparent. The writer cannot too strongly condemn a somewhat prevalent and very pernicious kind of cancer surgery which can only be described as meddlesome. It consists of removing by means of knife or cautery as much of the cancer mass as can be conveniently reached when it is perfectly apparent that the entire growth cannot be eradicated in this manner. The operator should feel some assurance that he can remove the whole primary growth, before he may conscientiously adopt any operative procedure. The only cases in the writers experience which have proven utterly intractable and non-responsive to either radium or roentgen rays, have been those previously stimulated to increased activity by improper surgery. To destroy part of a fungating mass in the vagina by means of the actual cautery can accomplish no purpose except perhaps to control the hemorrhage. This the radium will do as effectually, while at the same time it will inhibit rather than stimulate proliferation of the remaining cancer tissue. Reports of two cases now under observation may serve to illustrate and emphasize this point. Mrs. M. C. Aet. 62. First observed on August 11th, 1919. An extensive carcinoma of the cervix extending well up into the fundus. The cervix was deeply eroded. There had been some bleeding for two or three months, hemoglobin was 63 per cent, and there was progressive loss of weight. The surgeon to whom she reported, placed her in the hospital and immediately did a vaginal cautery operation. As he expressed it he had "cauterized everthing in sight, and if you can do anything with your radium you should be able to do it in this case." Fifty milligrams of radium properly filtered, was packed into the cavity produced by the cautery, and allowed to remain there sixty hours. There was of course no way to determine whether this accomplished any good purpose or not. Four weeks later she was given one course of intensive roentgen treatments through the abdomen and back. Already debilitated by the previous loss of blood and the cautery operation, the constitutional reaction to the x-ray therapy was severe, and she refused further x-ray treatments. Three months later, the surgeon performed a complete pan-hysterectomy, removing as much tissue as possible including one ureter. Under these conditions, it is not necessary to describe the patients present condition, after her long sojourn in the hospital ward. Nor can there be any reasonable doubt of a progressively fatal termination.

CASE No. 2

Mrs. O'K Aet. 67. About eight months ago, she noticed a slight bleeding, but this soon stopped and she did not consider it of importance. One week ago, following an enema, she had a severe hemorrhage from the uterus after which there was slight bleeding which continued up to the time of examination. Examination by Dr. Voyer showed an extensive erosion of the cervix, and a fungating mass in the vagina. When palpated through the rectum the fundus appeared large and very hard. Two days later, after confirming the above observations, the patient having been anesthetized, I placed within the cervix twenty-five milligrams of radium element filtered by three millimeters of silver and one millimeter of brass, and a similar quantity equally filtered in the cul-de-sac on either side of the cervix. This was permitted to remain undisturbed for forty hours. There has been no bleeding since the removal of the radium on October 4th, and the discharge which was very foul and profuse stopped after a few days. Improvement in general health and strength has been rapid and progressive. She has three full courses of deep x-ray treatments through the abdomen and back, given at monthly intervals. When I examined her a few days ago, I found the cervix of normal consistency, and the uterus reduced to about normal size. The mass in the vagina has entirely disappeared. By way of contrast with the other case reported, let it be noted that this patient has lived her normal life since the first two weeks, and now feels perfectly well. She may be regarded as symptomatically cured, and if she will take prophylactic treatments at intervals of six months she may remain well for several years. In any event, the prognosis should be as good or bet-

ter than that of case No. 1 while she has been spared much suffering, a long expensive stay in the hospital and the shock of a mutilating operation.

Microscopic studies of cancer tissues under radiation show that the chief effect is due to inhibition of cell proliferation. Some interesting and apparently instructive experiments with crown gall, a disease of plants which appears to resemble cancer in that its growth depends directly upon cell proliferation, are reported by Levin and Levine in The Annals of Surgery for April, 1918. The growth of the crown gall could always be stopped by x-ray radiation, while in the un-rayed controls the disease regularly developed and destroyed the plant.

Returning to the studies of human cancer, there may be no destructive action upon the cell itself, but since the latter is naturally of short life when deprived of its essential function, kariokinesis, it tends to atrophy and disappear. The cancer tissue is replaced by a round cell infiltration, which in turn is replaced by dense sclerotic connective tissue, poor in blood supply. Since this is not favorable soil for the further development of the cancer, any recurrence is likely to take place out-side of these areas.

Examination of irradiated cancer tissues, however, usually reveals occasional nests of atypical cancer cells with flattened atrophic nuclei. These cells apparently remain dormant for a variable length of time and then again, perhaps under traumatic stimulation begin to actively proliferate. It seems logical that if further treatment can be applied at the moment when these cells are beginning to regain their function, cell division can again be arrested and thus the disease may eventually be eradicated. But it does not suffice to wait for clinical evidence of recurrence when the process may be beyond control. And the deleterious effect of prolonged radiation upon normal tissues prohibits continued treatment. Hence my present technic, which seems best to fulfill all requirements, includes six months of active treatment followed by an interval of six months rest, then three to six months of treatment followed by an equal period of watchful waiting. In certain post-operative cases which have seemed especially likely to recur, a third series of treatments have been given. While the results of this most thorough procedure have been promising, sufficient time has not elapsed to justify too much optimism. In fact, the time is not yet come, when one may properly speak of "cure" of cancer of the cervix, but only better palliative results or "symptomatic cure."

Statistics rapidly accumulating are of great value and interest, but it must be borne in mind that they are based for the most part upon advanced and inoperable cases, since surgery is still the accepted method of choice in the earlier cases. Scherer and Keley, having treated 218 cases of cancer of the cervix with x-rays and radium, conclude that freedom from recurrence was 10.5% greater than operation alone formerly gave. Bumm recorded one hundred and eight cases only five of which were considered operable. Of these there had been but 15 recurrences at the time of the report. Doederlein reported symptomatic cures in 31 out of 153 cases and 12 of these had been classed as inoperable.

In the dim light of present knowledge therefor, there is much justification for the substitution of radiation for all surgery in cancer of the cervix. Yet the radiologist is not anxious to assume this responsibility alone until he has a greater mass of statistics to support him. He is however ready to demand that in all cases treated surgically, proper and intelligent radiation therapy shall be employed, and that before operation it shall be carefully determined in each case whether treatment shall be pre-operative, post-operative or both.

Certain authorities are advocating that when post peritoneal metastases are found, drainage tubes containing radium may be stitched in place in order that direct action may be had. The radium may be withdrawn and replaced at different points from time to time before the tubes are finally withdrawn. By this procedure it is hoped to effect a clinical cure in certain cases which would otherwise progress, uninterrupted, to a fatal terminus despite complete control of the primary lesion.

There is no selective action of the rays. While

it is true that the less highly differentiated cells of certain new growths or of glandular structures are more easily affected than other cells, yet this is only relative and other tissues through which the rays penetrate do not wholly escape. Since it is known that small doses will stimulate the proliferation of the same cells which larger doses will inhibit and destroy it becomes apparent that he who is too timid lest he injure normal tissues will frequently produce an effect quite the reverse of that which he is striving to attain.

The surgeon has long since learned that he cannot eradicate cancer except through the boldest sacrifice of normal tissues, yet he is often the first to condemn the radiologist who "burns" a patient in his conscientious efforts to destroy the disease. Yet, because x-ray inflammations are sometimes very painful and so chronic that they interfere with further treatment, they must be avoided as far as is possible without sacrifice of efficiency. By judicious selection of the proper filters for each case and the employment of some ingenuity in "cross firing" it is usually possible to attack the diseased tissues with the maximum quantity of radiation without seriously or permanently damaging the overlieing structures. In this connection, let us take a glance into the future, when the varying physiologic action of rays of different wave lengths will have been completely tabulated and when it will be possible to select specific rays for each condition with which radiation therapy has to contend. We are already empirically selecting different filters for tuberculosis than for cancer even though the disease is at the same depth, since experience has taught that rays of longer wave length have a more specific effect upon the former disease.

I wish to record here a single case in which the marked curative effect of roentgen radiation upon deeply seated cancer was most clearly demonstrated. To-day I should of course employ radium, as well as x-rays in this case, but at that time I was relying solely upon roentgen radiation.

CASE REPORT

Mrs. C., aged 58, was referred to me in July, 1916 by Dr. A. MacLaren of St. Paul. He had previously performed a laparotomy upon the insistance of family although he regarded the case as inoperable and had advised against operation. It was found impossible to remove all of the cancerous tissue. She was carried to my office by stretcher and I found a readily palpable mass in the vagina which bled upon slight traumatism. She was markedly anemic, in considerable pain and was rapidly losing weight.

The abdomen and back were divided off into three inch squares and a skin tolerance dose under three millimeters of aluminum was given through each of these areas. This course of treatments was repeated at intervals of one month for six months. At this time the patient was traveling alone from North Dakota to Minneapolis for treatment and there was a complete absence of both objective and subjective symptoms. In other words it was a symptomatic cure. Another series of treatments was given after three months. One year later she developed a partial intestinal obstruction from adhesions and a laparotomy became necessary. At operation no evidence of carcinoma could be found. During convalescence, however, there was a recrudescence of the disease and the patient soon died of metastatic cancer. I believe that this patient without the operative traumatism might have lived in good health a much longer time, but that she would have eventually died of cancer when the disease became reactivated.

"UTERINE MYOMA"

The treatment of uterine myoma by radiation therapy is justified by the operative mortality under surgical attack, however small that may be, and by the fact that all women have an inherent and ineradicable antipathy to the thought of such a mutilating operation, unless it is necessary for the preservation of life. Either roentgen rays or those of radium are a specific in that they completely control the only dangerous symptom, the hemorrhage. With the menopause established, the tumors tend to retrogress and a complete and permanent symptomatic cure is established. It may therefor be stated that surgical intervention is contra-indicated in these cases, except in certain selected ones wherein it is highly desirable

to preserve the menstrual function. In many cases, a diagnostic curettage is necessary to eliminate the possibility of cancer. But the argument sometimes advanced, that hysterectomy should be performed to prevent the carcinomatous degeneration of the myoma has little support in statistical studies. It has yet to be shown that carcinoma develops in myomatous uteri with greater frequency than in others in the same period of life.

The choice between roentgen rays and radium must depend upon various factors. If haste is indicated because of profuse hemorrhage, radium has the advantage, since the control is usually more prompt and complete than that of the x-rays. If the patient is an ambulatory one, and time is not so important, symptoms can be controlled with less disturbance to the patient by means of roentgen rays.

As to the action of radiation which produces the desired effect, the destruction of the Graafian follicle doubtless accomplishes the menopause. It would seem too that, with radium, there is a more immediate effect upon the uterine mucosa causing the blood vessels to contract and the congestion to recede. It is rarely necessary to apply the radium more than once but in a few instances it has been necessary to give a few roentgen treatments following the radium to completely establish the menopause.

It may conservatively be stated that it is possible by means of proper roentgen radiation, or radium applications or of both judiciously combined, to establish an artificial menopause in any case at any age. It is probably not possible, at least with any known technic, to effect a cure of myoma or fibroid tumor without producing a menopause. On the other hand certain cases of metrorrhagia of unknown etiology respond so readily to light dosage that normal menstruation is not interfered with while the ad interim bleeding is entirely stopped. Those cases which are characterized by general fibrosis of the uterus without demonstrable tumor seem to respond to roentgen radiation less readily than the myomata, but they are promptly controlled by radium.

I have had occasion to treat twenty-three cases of menorrhagia due to fibroid tumor or myoma in the past three years. With but one exception results have been wholly satisfactory. The exception was one of my early cases, treated before my technic was well standardized, and in this instance there developed a deep x-ray inflammation of the abdominal wall which required surgical removal. While I do not believe such an accident is possible with my present technic, it is an accident which many roentgen therapists have had in their earlier experience, and should serve as a warning to beginners.

The cessation of the menses is usually gradual under x-ray treatment, so that it has required from four to six months, in the writer's experience, to completely establish the menopause. As previously stated, radium will do the work more promptly. Two cases of uterine tumor with pressure symptoms but no abnormal bleeding have not responded in a satisfactory manner. The menopause was accomplished, and the tumors became smaller, but the symptoms, mostly neurotic in character, continued.

The following case reports are presented to illustrate the various types of cases which have responded well to treatment.

METROPATHY OF QUESTIONABLE ETIOLOGY

Mrs. E. H. McV. age 22 years, was referred by Dr. J. C. Litzenberg for x-ray treatment. She began menstruating at the age of thirteen but had never menstruated normally. For the past six years, there has been continuous bleeding eight months of the twelve. At this time, Sept. 21st, 1918, there has been a constant flow since May, and it is now quite profuse. Hemoglobin is 55 per cent. Treatment consisted of a 2/3 skin-tolerance dose given through two ports of entry with a filter of four millimeters of aluminum. The following day the bleeding stopped and did not recur for four weeks when she menstruated normally for three days. Since that time, with the exception of a brief pregnancy followed by miscarriage, menses have occurred at twenty eight-day intervals, and lasted for three to four days.

FIBRO-MYOMA

Miss M. H., Aet. 42, a school teacher, was referred by Dr. Olga Hanson on Nov. 9th, 1918.

The tumor could be palpated through the abdominal wall and reached nearly to the umbilicus. For several months, there had been a menorrhagia lasting about ten days, with each period. Through twelve ports of entry, abdomen and back she was given a skin tolerance dose, four millimeters of aluminum being used to filter the rays. On Nov. 30th, there was a noticeable reduction in the size of the tumor, and she reported a marked decrease in the flow. Treatment was repeated at twenty one day intervals up to and including Jan. 18th, 1919. At this time the menses had entirely ceased, and the tumor was no longer palpable through the abdomen. She was discharged as cured. There has been no recurrence of menstruation, her general health is much improved, and she has gained about twenty five pounds.

UTERINE FIBROSIS

Mrs. J. H. K., referred by Drs. Cross and Litzenberg. The uterus was somewhat enlarged but no tumors could be demonstrated. Diagnostic curettage had proven negative. Menorrhagia was profuse and uncontrolable. She was given two courses of x-ray treatment, one on Nov. 11th, and one on Dec. 3rd and 5th. After the first there seemed to be marked improvement, but later the bleeding recurred and it was decided to resort to radium as the patient was becoming exsanguinated. On Dec. 20th, she was given 2000 MgHr. the radium being placed in the cervix and cul-de-sac. There has been no further loss of blood and the patient is rapidly recovering her normal blood picture.

Mrs. C. S., a physician's wife, referred by Dr. Ritchie, of St. Paul, has had five pregnancies and the last two have been concluded by difficult instrumental deliveries. At each menstrual period she has an excessive flow for five or six days followed by a slight but continuous flow for two weeks. A curettage in Feb. 1919 has proven negative from both a diagnostic and therapeutic stand-point. No pathological process could be found, but hysterectomy was under consideration. She has been given three courses of roentgen treatments, and at this writing the menstrual flow has assumed normal proportions.

CONCLUSIONS

Combined radium and x-ray therapy is the treatment of choice in all cases of cancer of the cervix.

In the early cases, conservative surgery followed by radiation is justifiable but probably the latter alone will prove equally efficient.

In carcinoma of the fundus, surgical results have been so good, that these cases should all be submitted to operation. As in all other cancer cases, however, the patient should be given the added benefit of post-operative radiation.

Radiation should be accepted as a specific in the menorrhagias due to myoma or fibrosis or those of unknown etiology.

TUBERCULOSIS OF THE THYROID*

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The literature on tuberculosis of the thyroid may be divided into three classes: (1) Reports of isolated cases usually of the so-called primary type, in a number of which the clinical picture and pathologic appearance of the gland had been modified by secondary infection and abscess formation; (2) descriptions of the histologic findings in thyroids obtained in routine necropsies in persons having died of general miliary tuberculosis; and (3) studies based on reviews of the pathology of simple and exophthalmic goiters.

Reports such as those of Fraenkel in which tuberculosis of the thyroid was said to have been demonstrated in all except six of 580 necropsies following deaths from general miliary tuberculosis are of value, but clinicians are especially interested in reports based on pathologic material from persons who have had definite goiters or who have complained of symptoms due directly or indirectly to thyroid disease.

Ruppanner, in 1908, reported 3 cases of colloid goiter in which he had demonstrated areas of tuberculosis. Werdt, in 1911, found tuberculosis in one gland in 28 cases of ex-

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ophthalmic goiter, and in three glands in 444 cases of simple goiter. Mosiman, in 1917, reviewed the literature and reported 9 cases in which operation had been performed in the Crile clinic. The glands in 5 cases which had been previously diagnosed exophthalmic goiter also showed hyperplasia. One of 2 patients who had been designated as having had mild or questionable exophthalmic goiter had hyperplastic areas; one patient who had had hypertension, and another, were sarcoma of the thyroid did not show hyperplasia.

Mosiman's admirable report brought out the striking relationship between hyperthyroidism and tuberculosis of the thyroid. This association is evidently not a coincidence; either a hypertrophic gland is rendered more susceptible to invasion by the tuberculosis bacillus or the infection stimulates the parenchyma to an abnormal activity and is thus indirectly responsible for the hyperthyroidism with its attendant symptoms. Although the great majority of hypertrophic thyroids are not tuberculous, any infection which may even in a few instances be an etiologic factor is of interest in dealing with a disease the cause of which is so shrouded in mystery.

Few, if any, of the cases of tuberculosis of the thyroid which have been reported were diagnosed previous to the microscopic examination of the glands. The condition was not suspected in any of our cases previous to operation, and their study was pursued in the hope that some evidence might be gained which would indicate whether or not the hypertrophy was secondary to the tuberculous infection, and also with a view to determining, if possible, any diagnostic points which in the future might lead us at least to suspect the condition previous to or at the time of operation. In using the term hypertrophy we refer to the cell hypertrophy, that is, the transition of the normal cuboidal to the columnar type of epithelial cell.

We shall report briefly 7 cases that have been under observation in the Mayo Clinic. A full discussion of the symptoms and findings will not come within the limits of this paper. For convenience these cases are divided into three groups: (1) Cases with high degree of hyperthyroidism, (2) cases with a moderate degree of hyperthyroidism, and (3) cases in which hyperthyroidism was mild or absent.

Case 1 (Group 1). This patient had had general symptoms for four years but no local symptoms. The thyroid gland was diffusely enlarged and slightly nodular, but not unusually hard. There was no tenderness to pressure. Bruits and thrills were present. The basal metabolic rate was +48. A clinical diagnosis was made of exophthalmic goiter, with the degree of severity 3 on a scale of 1 to 4. At operation the gland was thought to be hypertrophic with multiple adenomas. The pathologic examination revealed scattered areas of tuberculosis, a slight amount of fibrosis, some round cell infiltration, and extensive parenchymatous hypertrophy.

Case 2 (Group 1). This patient had been conscious of the goiter for eight months; symptoms had been noted for ten months. The basal metabolic rate was +87. The thyroid gland was slightly enlarged with the granular "feel" of a hypertrophic condition. Bruits and thrills were present. The clinical diagnosis was exophthalmic goiter, degree of severity 3. At operation both lobes were found to be about two and one-half times normal in size and had the appearance of an ordinary hypertrophic gland. The pathologic findings were the same as those in Case 1.

Case 1 (Group 2.) The goiter had been diagnosed by the family physician six months before. General symptoms had been noted for two years; there were no local symptoms. The thyroid gland was about normal in size; it had no nodules but was unusually hard for a hypertrophic gland. The basal metabolic rate was +26. Exophthalmic goiter was diagnosed, the degree of severity 2. A normal sized gland which appeared to be hypertrophic was found at operation. Extensive tuberculosis, a moderate amount of fibrosis and round cell infiltration, and a fair degree of parenchymatous hypertrophy were found on pathologic examination.

Case 1 (Group 3). The general symptoms in this case had been present for one year; no thyroid enlargement and no local symptoms had been noted. The patient's neck was short and fleshy, and, except for a hard nodule on the left side about 1.2 or 1.8 cm. in diameter,

neither lobe of the thyroid could be palpated. The isthmus was palpable and unusually hard. The basal metabolic rate was +21. The diagnosis was definite hyperthyroidism, with degree of severity 1. The condition was considered unusual and thought to be exophthalmic goiter or thyrotoxic adenoma. The gland was found firmly adherent to all the surrounding structures, muscles, fascia, and trachea. Very little bleeding occurred during the removal of the gland which indicated an old inflammatory condition. In cutting across the gland the surgeon found a large amount of scar tissue. The pathologist reported extensive tuberculosis, marked fibrosis, round cell infiltration, slight parenchymatous hypertrophy, and great destruction of the gland.

In the goiter of Case 2 (Group 3.) Four months before this patient's examination enlargement of the right lobe had been noticed. General symptoms had probably existed for one year; there were no local symptoms. The thyroid had the contour of a normal gland, although about three times its normal size; it was hard, and slightly nodular. The basal metabolic rate was +21. A tentative diagnosis was made of mild hyperthyroidism, with degree of severity 1, probably exophthalmic goiter, possibly carcinoma of the thyroid. At operation the gland was found to be hard and resembled carcinoma but was believed to be some form of infection throughout the gland. As in Case 1 of Group 3, the pathologic examination revealed extensive tuberculosis, marked fibrosis, round cell infiltration, slight parenchymatous hypertrophy, and extensive destruction of the gland.

Case 3 (Group 3.) The general symptoms had probably been present for two years. The patient complained of pressure in the throat. A very hard tumor in the left lobe of the thyroid was not sensitive to pressure; no bruits were heard in the thyroid vessels. The metabolic rate was not determined. A diagnosis was made of neurasthenia with a possible thyrotoxicosis from an adenoma. Because of the density of the tumor, carcinoma of the thyroid was also considered. Examination of the gland removed at operation showed degeneration and inflammation. The only normal tissue remaining was that in the pyramidal lobe. The surgeons were suspicious of malignancy. The pathologist discovered about the same amount of tuberculous destruction as in Cases 1 and 2 of this group, but more parenchymatous hypertrophy.

Case 4 (Group 3.) In this case enlargement of the right lobe of the thyroid had been noticed for one month. Three weeks before examination the left side had begun to enlarge. A neurasthenic syndrome had been present for years. The lobes were not greatly enlarged, but were very hard; a small nodule could be palpated in each. A clinical diagnosis was made of a small adenoma of the thyroid, possibly carcinoma, because of the recent development and extreme hardness of the gland. At operation a small hard tumor pressing on the trachea was found. The surgeons were unable to exclude malignancy, but considered the condition inflammatory. The pathologic findings were practically the same as in the other cases in Group 3, although there was more destruction and fibrosis, and no parenchymatous hypertrophy.

The 2 cases in Group 1 represent typical high grade exophthalmic goiters. Before operation the glands were believed to be ordinary hypertrophic thyroids. The surgeon did not detect any unusual condition. The pathologist reported extensive parenchymatous hypertrophy with tuberculosis in scattered areas.

The single case in Group 2 represents an intermediate stage. This was a case of typical exophthalmic goiter, but with a less severe degree of hyperthyroidism. The surgeon apparently did not consider it more than an ordinary hypertrophic gland. The pathologist reported a fair degree of parenchymatous hypertrophy, also very extensive tuberculous involvement.

In all but one of the cases in Group 3 the thyroids were smaller than those in Group 1. The glands were hard, somewhat fixed, and nodular; two of them had grown rapidly. The clinician had recognized an unusual condition in all, and had suspected carcinoma in three. In the first 2 cases the definite evidence of a mild degree of hyperthyroidism was confirmed by basal metabolic rates. The last 2 patients were examined before we had the means of estimating the basal metabolism;

however, hyperthyroidism had been suspected in the first of these; in the last case no mention was made of the possibility of hyperthyroidism. The parenchyma of this gland was so completely destroyed that the diagnosis of the absence of hyperthyroidism made at that time was probably correct. The striking point in the cases is that 5 of the patients probably 6, were suffering from hyperthyroidism. The greater the tuberculous involvement the less severe the toxic symptoms. This may be explained by the more extensive destruction of the glands.

In 2 of the 5 patients with definite hyperthyroidism the goiter was noticed before the symptoms; in 2 the opposite was true, and in one no thyroid enlargement had been discovered. In these findings there is nothing decisive to indicate that tuberculosis preceded the hyperthyroidism. Even had we had a larger series it is doubtful whether definite conclusions could have been reached, as such tuberculous processes would undoubtedly have been progressing for months before the enlargements could have been noticed. The symptoms in these cases are so insidious that the time of the onset of the condition is difficult to determine. Probably all cases of tuberculosis of the thyroid are secondary to some process elsewhere in the body. In this series if such foci were present, they were too small to have any clinical significance; evidence of active tuberculosis elsewhere in the body could not be demonstrated on critical examination.

In Case 2 of Group 3 definite evidence of myxedema appeared at the end of two months. This condition has also been noticed in cases of simple chronic thyroiditis following operations. It is questionable whether the usual amount of thyroid tissue should be extirpated when the gland is inflammatory, because of the possibility of a resulting hypothyroidism caused by the subsequent destruction of the remaining parenchyma. Cases of the type placed in Group 1 can not be distinguished from ordinary exophthalmic goiter.

In cases similar to those placed in Group 3, the condition may at least be suspected before operation. Carcinoma of the thyroid may be associated with hyperthyrodism, but the growth is usually more nodular, and is not so apt to involve the entire gland without causing a much larger tumor. Chronic simple thyroiditis may give the same thyroid signs as tuberculosis, but in our experience it has not been associated with hyperthyroidism. Sarcoma of the thyroid is a rare condition, and we have never had a case of actinomycosis.

Three of our patients were operated on too recently to give us any definite information as to the ultimate prognosis following operation, but they have all been benefited. One patient had myxedema. One is in perfect health two years following operation. The other two have not been heard from recently.

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DISCUSSION

DR. W. W. HERRICK, Columbia University, New York: Mr. Chairman, Gentlemen: There is one feature of this paper which is of rather general interest. The function of focal infection in stimulating abnormality of this gland has been repeatedly brought up. We have in this paper an example of a single infection inciting abnormal activity of this gland. Perhaps the tubercle bacillus is the only one that can be demonstrated at operation, and it is an interesting clue which might be followed up in looking for other organisms in connection with abnormal thyroids.

DR. E. L. TOOHY, Duluth: I would like to ask if it is not possible for an ordinary focal infection to stimulate a normal thyroid without any evidence of tumor formation or thyroiditis, and yet after removal of the focal infection to have the patient revert to normal.

DR. GEORGE DOUGLAS HEAD, Minneapolis: Mr. Chairman, Gentlemen: I want to ask one question. During my past twenty-two or twenty-three years experience I have run across a few cases of acute infective thyroiditis. The subsequent history and the course of these individuals we have never been able to follow up and I have lost track of them. In the material at Rochester,—this is an allied subject to this one and I think is a bit out of order,—but in the large series observed at Rochester I should like to know whether they find any considerable number of cases of hyperthyroidism which give a history

of acute thyroiditis in early life, and if so what the percentage is? It is allied to this matter of infection of the thyroid, the tubercle bacillus being only one of the various bacteria.

DR. W. A. PLUMMER: Because of the rarity of the disease under consideration a criticism might be offered on the presentation of a paper on this subject before the society were it not for the close relationship in pathology and symptomatology to ordinary exophthalmic goiter. Excluding these cases it has been our experience that patients suffering from hyperthyroidism have not given a history suggesting a previous thyroiditis. In a few cases in which the glands showed marked chronic inflammation, but which were not tuberculous, there was no symptomatology suggestive of hyperthyroidism.

In many hypertrophic glands of typical exophthalmic goiter there is some round-cell infiltration, but beside this finding we have had very little evidence to lead us to believe that direct infection of the gland was responsible. The tonsils have been considered as a possible focus. However, in exophthalmic goiter there is a hyperplasia of all the lymphatic structures and it is possible that the enlargement of the tonsils and the increased tendency to tonsillitis is a result rather than a cause.

THE UTERUS AT THE MENOPAUSE*

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In reviewing the literature of pelvic pathology, one is impressed with the great variety of therapeutic measures that have been suggested and the many operative methods that have been devised in the treatment of these conditions. There is but one conclusion that can be deduced from such an analysis—there is a great need for the standardization of the technic. It is too extensive a field to discuss in the time allotted, and for that reason it seems best to speak of that particular phase of the subject fraught with the greatest danger.

The period at the menopause, with its complex symptomatology and insidious pathology, is often treated by temporizing measures until the period of life-conserving opportunity has passed. The unusual hemorrhage, the peculiar discharge, the pelvic pressure have carelessly been called, "the change symptoms," and with the assurance that all will be well soon, the patient is dismissed. The adoption of radical measures in dealing with such conditions, at this period, offers the surest protection to women from cancer.

The atypical uterine hemorrhage, or the returning flow about the period of the menopause, is the most pronounced danger signal, warning us of conditions which require timely correction to eliminate what, today, should be recognized as truly a precancerous state. In general, it might be stated that any pathology of the cervix, or fundus, may be regarded as a precancerous condition which may not present any special symptomatology until gross malignancy manifests itself. It seems timely to review some of the more frequent disturbances presenting themselves in our routine work, such as require painstaking diagnosis to insure proper treatment.

FREQUENT PATHOLOGICAL DISTURBANCES

The first class includes the cases generally recognized as chronic metritis, hemorrhagic endometritis, cervicitis, and pelvic inflammation. Practically all have a uniformly enlarged hard uterus, though occasionally the uterus is flabby and all belong to that class so frequently curetted only to have a recurrence of the symptoms. These are the cases that are being extensively treated by the application of radium and many favorable statistics are being compiled in its favor. We must bear in mind, however, there is always danger of spreading an infection, if present, with the radium treatments, and in many of these cases the end-results will be much more satisfactory by resorting to the more radical surgical measure.

The second group might properly be classified as the fibroids. In this class we must remember that the presence of the tumor, especially the large growths, or the multiple fibroid, gives rise to essential pathological changes in the adnexa through circulatory disturbances. Various cystic diseases of the ovaries, chronic salpingitis, or hydrosalpinx are frequent complications of fibroids, being in a great measure the cause of pain, from which the woman seeks relief. While it is not difficult to palpate a uterine tumor of moderate size, the large, or the multiple tumors, with possible adhesions, or necrotic changes are difficult to diagnosticate previous to the opening

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of the abdomen. With the fibroid growths, the coexisting development of carcinoma of the uterus, or in the growth itself, must not be overlooked. The treatment of the second group, in the writer's opinion, is surgical because of the frequent complicating pathological conditions in the adnexa and the unrecognizable degenerative changes, many times impossible to determine previous to operation. The use of radium will control the hemorrhage and reduce the size of the tumor in the uncomplicated cases, but its use is limited and should not be applied indiscriminately in the complicated cases. The relief of the symptoms is necessary, but the restoration of permanent health of the patient is the ideal of surgery. The indications for operation are, a rapidly growing tumor, pain, pelvic incarceration, adnexal and ovarian disease.

The third class is the carcinoma,—the class that gives us the greatest concern, because of the great difficulty confronting us in arriving at a positive diagnosis, when the case is in its incipiency. The greatest hope of eradication of the disease is at a period when definite symptomatology is not yet well established. After a woman has stopped menstruating for some months and she begins bleeding again, one must always suspect malignancy. If the involved area is in the region of the cervix, an excision of a portion of the cervix may be resorted to, or a curette may be used if we suspect an involvement of the fundus, to obtain material for a microscopic examination. Either of these procedures may give us a negative diagnosis, as cancer cells may not be included in the specimen. However, this method will confirm many clinical diagnoses, and may help in a decision for an early operation. Every hospital at the present time should be equipped with a laboratory where a frozen section could be made and an immediate radical operation should be performed, in case the diagnosis is positive, in this way obviating the danger of spreading the disease. The use of radium, in this class, is positively contraindicated at the early period. Its use in the pelvis, as elsewhere, is efficacious in post-operative treatment; also, in cases where the disease has become so extensive that excision is not possible. A woman can be made more comfortable and the discharge reduced by its use, much to the happiness of the patient.

The frequency of carcinoma of the uterus is best expressed by quoting Bland[1] who states that about eighty-seven per cent of all cases of uterine cancer occur between the ages of thirty-five and sixty-five. Thirty per cent of all cases of cancer occurring in women originate in the uterus. One woman out of every twenty-seven, or about four per cent, die of uterine cancer. As diagnostic criteria, the local symptoms are the most dependable, and in order of frequency and importance are hemorrhage, leucorrhoea, pain, bladder, and rectal irritability.

From the study of Rubin[2] we learn that the cervix suffers the brunt of obstetric trauma, as well as infections, hence the great frequency of cervical carcinoma, as compared to carcinoma of the corpus; that carcinoma of the body is most often associated with polypi or myomata; that the malignant change occurs after a long period of irritation and is rendered more likely, when the retrogressive changes set in, and when the protective influence of the endocrine glands, especially that of the ovaries, begins to abate.

It would be well to premise that every pathological uterine condition, about the period of the menopause, is of a malignant nature until, by careful analysis, it can be disproven.

THE TREATMENT OF PATHOLOGICAL CONDITIONS

After the period of reproduction has passed, total abdominal hysterectomy should be done oftener than it is. It should always be the operation of choice in suspected malignant conditions. In many cases, with a history of long standing symptoms, if cancer is not already present, it may develop later. The fear of a scar or sentiment, should never deter one from fearlessly attacking these pathological conditions. Repeated conservative operations are not only annoying to the surgeon, but they often deplete the physical condition of the patients, upset them mentally, and reduce them to a state of semi-invalidism from which they never recover.

It is time to conclude that the vaginal route is a splendid avenue for pelvic drainage, but not a natural gate-way for pelvic surgery. No matter how dexterously one can remove the

uterus through the vagina, he is not doing his patient justice in practicing this method. The best results can be attained only by exposing all parts to the eye as well as to the touch. In removal of the uterus, for malignant conditions, the widest possible extirpation of tissue should be practiced. The adjacent parts must be left properly supported by the attachment of the ligaments, and the cut surfaces in the pelvis thoroughly covered by peritoneal membrane. This can be done only through the suprapubic incision.

Pioneers of pelvic surgery surely did not leave very encouraging statistics for abdominal hysterectomy. We must remember, however, that their shocking mortality was due largely to sepsis, and not so much to faulty technic. The basic principles of Freund's technic, for abdominal hysterectomy, are the steps followed, practically, by the operators of today. The development of aseptic surgery has obviously reduced the mortality, and statistics show it to be a safe method. The necessity for the abdominal route has always been self-evident.

CONCLUSIONS

1. It is necessary to exercise the highest degree of diagnostic skill in differentiating pathological conditions, that malignancy be not overlooked, at the period of the menopause.
2. Many symptoms that have manifested themselves over a long period are precancerous and should be treated as early cancer.
3. When the retrogressive changes set in and nature is about to obliterate the organs of reproduction, total abdominal hysterectomy should be practiced, if pathological changes necessitate the removal of the uterus.

REFERENCES

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2. Rubin. Am. J. Obstetrics, N. Y., 1918, LXXVIII, 353.

DISCUSSION

DR. LEDA STACY, Rochester: Dr. Wanous has very forcefully called attention to the frequency of carcinomatous degeneration of the uterus at the time of the menopause. This fact should be kept constantly in mind when taking a history and making an examination at this period of life.

The statistics of the Mayo Clinic during a period of ten years show that only 44 per cent of the cases of carcinoma of the uterus were operable at the time of examination; Dr. Howard Kelly reports a percentage of 50; and Dr. Wertheim 65 per cent operability in the cases of cancer of the uterus at the time of examination. This means that the medical profession has neglected the education of the laity regarding the symptoms of malignant degeneration of the uterus.

I would add to the symptoms which Dr. Wanous has mentioned, that of an abnormal leukorrhea, or a watery discharge with an odor, as one of the early symptoms of carcinoma of the uterus.

The treatment of all operable cases is still surgical, followed by the use of radium and x-ray. As the essayist has said, the ultimate results of radium therapy are not as yet sufficiently known to resort to the use of radium in the early cases. I agree with the essayist as to the necessity of a correct microscopic diagnosis at the time of curettement and if the tissue is reported malignant, the radical operation should be done immediately.

The fallacy of basing a diagnosis entirely upon the findings at the time of curettement has been pointed out. The curette may not come in contact with the carcinomatous area, and a negative report made and valuable time lost to the patient.

As a result of atrophic changes in the endometrium, stenosis of the uterine canal may occur and a chronic endometritis may develop into a pyometritis. In an occasional case, drainage is not sufficient and surgical interference may be indicated.

In reviewing the postmortem examinations at Johns Hopkins Hospital in 742 autopsies performed on women over 20 years of age, it was found that 10 per cent of all white women and 33 per cent of all colored women had one or more myomas of the uterus. The tumor had undergone some necrotic degeneration in 17 per cent of these cases. Hence the possibility of degeneration of myomas at the time of menopause must be borne in mind, as the atrophic changes in the blood supply may produce degenerative changes in the myoma.

As brought out by Dr. Wanous, radium should be used only in those cases of uterine myoma in which there is no evidence of pelvic inflammation, as it may light up an old dormant infection.

PROLAPSE OF THE UTERUS*

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This paper is based on a report of fifty consecutive cases of prolapse of the uterus coming under our observation and operated during the past six years. From our observations and experience gained in these cases, as well as from watching and seeing the results of other types of operation for prolapse, I believe that our results give by far the greater percentage of cures, not only anatomically but also symptomatically.

Our cases show as to ages, 6 cases coming in the sixties, 17 in the fifties, 18 in the forties, 7 in the thirties, and two in the twenties. As can be seen, the most frequent age seems to be in the forties and fifties.

All of our patients had had children previously with one exception. Two cases had been previously operated by other methods with recurrence, and one case had been operated twice before for the same condition with recurrence. As a rule, the patient will come in with her own diagnosis, ie. "the womb comes down." However, in many cases, instead of one symptom as above, which on examination may reveal only a cystocele and rectocele, quite a number of cases came in with the primary complaint of uterine bleeding, not profuse, but continuous. On examination one finds a third degree prolapse, with marked ulceration of the cervix. With some the chief symptom seemed to be inability to properly empty the bladder, with some incontinence, others had residual urine.

Although it is very difficult to classify cases as to degree of prolapse, still we have attempted to do so:

In the first degree, we put those in whom we find more or less laxness of the perineum, with possible retroversion, and possibly a small cystocele, and no marked prolapse of the uterus, but a marked degree of laxness of the pelvic floor. In the second degree there is a retroversion, cystocele usually, and occasionally a rectocele. On grasping the cervix with tenaculum forceps you may pull it down through the vulva, or by asking the patient to strain and bear down one can force the uterus through the vulva. In the third degree the patient is able to completely expel the uterus.

In all our cases cystocele has been found, the anterior fascia having been torn and allowing the bladder to descend. In many of the cases this was the first symptom or the first sign that the patient had of a possible prolapse. Rectocele has been fairly common, but not so frequent as cystocele. Laceration of the cervix may or may not be found. However, all our cases that had a third degree prolapse had an erosion of the cervix. We have never seen a malignant growth of the cervix in these cases. The uterus is always retroverted or in middle position. In many cases the cervix had become elongated, particularly where the prolapse has been of long standing.

In those cases coming under first degree, or, as one might say, in those cases headed towards a prolapse, we prefer the Baldy-Webster operation, and repair of the perineum and cystocele has been sufficient to give the patient a great deal of comfort and to cure these cases.

In the second and third degree prolapsed cases, one must here use some judgment before deciding on the exact type of operation that one wishes to do. As said before, cystocele invariably is present. In these advanced cases in our opinion there is only one type of operation that combines safety, comfort to the patient, and the largest percentage of cures. I refer here to the interposition operation, whether after the so-called "Wertheim-Watkins" method or the so-called "Mayo" method. If the uterus is of good size and not atrophic, I prefer the former; if atrophic, by all means the Mayo method.

It may not here be amiss to go briefly into detail as one proceeds with the operation: After thorough application of Iodin the cervix is grasped with tenaculum forceps, and an inverted "T" incision made in the anterior vaginal wall. Then by gauze and blunt dissection the bladder is readily freed, both laterally and anteriorly. There is practically no danger of injuring the ureters, because before you come to them you will undoubtedly get into a plexus of veins, which, however, one should guard against rupturing if possible. The blad-

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der is now freed from the anterior uterine wall and the anterior cul-de-sac entered, taking great care, however, not to tear into the bladder. Many times one can determine at this point whether he should do the Wertheim-Watkins or the Mayo type operation. If the Wertheim-Watkins operation, the fundus of the uterus is grasped and pulled down and out, so as to expose it at the vulva. At this stage, if one should have adhesions posterior, they can be freed, or if fibroids should be encountered they may be taken care of as one thinks best. After the uterus has been pulled forward and the bladder has been shoved up, the anterior peritoneal flap is now stitched to the posterior uterine wall. At this stage the uterus is practically extraperitoneal. The redundent anterior vaginal wall is now excised, and by interrupted stitches, which include the anterior uterine wall, the anterior vaginal wall is closed. The vaginal wound is then closed.

In closing the anterior vaginal wound, two important stitches must be inserted: (1) The most anterior stitch must be so placed as to pass through the vaginal wall, picking up the deep fascia lying laterally to the urethra, and then passing through the fundus rather high up, coming out in the reverse order on the other side. This tucks the bladder well up and places the fundus and the uterus snugly under the pubes. (2) The other stitch of importance is the one in the anterior cervix, placed so as to make a firm union of perimetrium, uniting in front of the cervix, and in this way the cervix is pushed well posterior.

The short arm of the vaginal incision is now stitched laterally, so as to elongate the enterior vaginal wall. The cervix may be repaired or amputated as one sees fit, but here it must be borne in mind that the bladder is often dragged far down on the anterior wall of the cervix, especially when elongated. If one proceeds to do the Mayo method the short arm of the inverted T incision is carried around the cervix and a vaginal hysterectomy is done, the broad ligaments and the perimetrium being united in the center, and this brought down as a shelving portion, taking the same place that the uterus takes in the Wertheim-Watkins operation. This elevates the bladder and gets rid of your cystocele, at the same time preventing any hernia of the pelvis. The next, and very essential step is the repair of the perineum. Personally, my best results and most comfortable ones have been obtained by a method shown to me by Beckman at Rochester, the essential feature of which is the bringing together or uniting of the lateral bellies of the levator ani muscle, so as to insure a good firm union. Then with a continuous catgut stitch the fascia is united, and the skin closed by the subcuticular method. The perineum should be made as high as it possibly can be, this of course depending a great deal upon the age of the patient as well as her social status. If the patient has not passed the menopause, the question of sterility must be very frankly discussed with both the patient and her husband. The method of sterilizing followed has been to cut out the horns of the uterus and also excise a section of the tube.

Postoperative recovery in these cases has been very satisfactory. Many of them have had to be catheterized, but this should be guarded against if possible. The danger of urine trickling over perineal stitches is greatly overestimated. Unions have been in practically all cases by primary intention. Occasionally there is a little sloughing from tension of sutures, but the end results have all been very satisfactory. The patients have been extremely comfortable.

If catheterization is necessary it must be done with an extreme amount of care on account of the easy development of a cystitis. If cystitis develops it sometimes is rather troublesome affecting a cure because of the formation of pockets in the bladder, caused by the lifting up of the uterus.

We have encountered several postoperative complications, which in a review of the literature I see have also happened to other operators:

First, the question of cystitis. Many of these cases have had residual urine with a colon infection before operation. Others developed a cystitis with catheterization after operation. A cystitis in these cases is usually accompanied by a marked trigonitis, which is extremely difficult to cure. One of our cases has now been under observation for about two years and still occasionally has to come in for bladder irriga-

tions, there being a marked redness of the trigone.

The second complication is bladder pockets. This occasionally accompanies as an end result, due to the fact that the uterus presses upward, the bladder not having been freed as extensively as it ought to have been. This leaves a very unfortunate complication which it is extremely hard to treat properly, i. e. to get permanent results. One case under observation for two years can be made comfortable only by irrigation of the bladder with the injection of argyrol.

Incontinence of the urine we have not experienced. The return of the prolapse we have not experienced. In one case the perineum probably is not as good as it ought to be and allows a slight descent of the cervix. However, the cystocele and rectocele are cured, and there is no tendency for the uterus to come out. This case could not be classed as a failure, but was not an entirely satisfactory result. Pregnancy has occurred in one case postoperative in which the patient was supposedly sterilized at time of operation. After operation the horns of the uterus were excised but no portion of tube removed, and two years later the patient become pregnant. It was necessary at the seventh month to do a Cesarean section, which was done without any particular operative difficulty. The baby lived only three hours, however. The Cesarean section was elective. For the last three years this patient has not become pregnant, and probably is now safe. Dispareunia has been the complication and end result in two cases, of course due to too high repair of the perineum. In one case it was necessary to do a slight plastic under a local anesthetic in order to relieve the condition.

However, in view of the number of cases reported, the percentage of end results has been exceptionally satisfactory. The operation, as all vaginal operations are, is much more devoid of danger than abdominal operations, and therefore our conclusions are that we can unhesitatingly recommend this operation, not only for its comfort to the patient but also for its decrease of operative risk, and as most of these cases occur in patients in the forties and fifties it gives the patients a great deal of comfort to know that something can be done for them, whereby, without great operative risk, they can be made comfortable the rest of their lives.

DISCUSSION

DR. ARCHIBALD MACLAREN, St. Paul: I think Dr. Coventry's position in regard to procidentia uteri is quite sound, and I agree with him in most of the details. I am glad he brought the subject up because it induced me to look up my own results after a good many years, and we do not know exactly what our results are until we do go back and look them up again and find out what the after-results are personally.

I shall confine my remarks practically to Dr. Coventry's last two classes of cases. The first I have not included. First, the Watkins operation. It was about eleven years ago that I did my first operation by the Watkins method for complete procidentia, and that operation has been very satisfactory. I do not think that we should sterilize many women to do this, and in my early experience I sterilized more women by dividing the tubes than I do at the present time. My experience is divided into two stages. First, the stage of enthusiasm, where I did a good many Watkins operations; the last stage when I limited the Watkins operation much more than I did at first, because of the large amount of plastic work required. With modern anterior colporrhaphy you can obtain excellent results much better than those by the old operation where we took an ellipse out of the anterior wall. When we push the bladder clear back and get the fascia underneath the bladder and overlap it, as in a hernia of the anterior wall, we get good results in cystocele, which is the important thing in all procidentia operations.

The interposition operation is better than the Kocher operation where the uterus is taken up and placed in the abdominal wall. I have only done one or two operations of that kind and they were followed by a ventral hernia because they were not properly done; but I have seen the same results in the cases of men better operators than myself.

I have not had any experience with the Murphy operation where he divided the uterus, took out the lining membrane and spread it onto the abdominal wall.

I had a curious experience in trying to do a Watkins operation at the University Hospital many years ago. I started on the anterior wall of the uterus, the patient having been operated on before at the City Hospital in St. Paul, and kept following the uterus until I was up to my elbow, and later, in opening the abdomen, found the uterus was over a foot long; it was fastened in the anterior abdominal wall, and the procidentia had gone on developing and stretched out the uterus.

I looked up the results in a few of my first operations and found one has been cured eleven years, one nine and a half years, one nine years, and one has been cured seven years. Those are the ones that are important because, when we come down to later years, we cannot tell much about the results.

DR. J. W. LITTLE, Minneapolis: I wish to speak very briefly about the fixation operation. I practically abandoned it several years ago, but corroborating the statement made by Dr. MacLaren about the length of the uterus, I had a case some fifteen years ago—maybe twenty years ago—where I fixed the uterus to the abdominal wall, and I heard later from the doctor who brought the patient to me that she was in the same condition as she was before the operation was done. I put the uterus up so tightly against the abdominal wall between the muscles that I did not understand how the uterus could come down. I examined the woman and found the uterus fastened to the abdominal wall proturding from the vagina two or three inches outside of the vulva. If I had a case of that kind, intsead of fixing the uterus to the abdominal wall, I would do a vaginal hysterectomy and bring the broad ligaments together or do a transposition operation.

DR. C. L. RODGERS:, Minneapolis: There is just one point in my limited experience which stands out in this operation, and that is the temptation to either remove your cystocele to the extent that you will encroach on the anterior vaginal wall, or to the extent that you will get a stenosis of the vagina. That point stands out prominently because I have had one experience of that kind which is not particularly satisfactory, and because I have another patient now who has had a similar experience, so that in our desire to eliminate the cystocele we must make allowance for the size of the uterus and not pare off too much of the anterior vaginal wall, or we may get into trouble in many cases. The patient had taken treatment and had the effect of the escharotic as used in these suppositories, and already had atresia well started. I did not make enough allowance with my manipulation to prevent its increasing. That is just one point in the operation that I wish to call attention to.

DR. A. E. BENJAMIN, Minneapolis: I think there is no one thing that has bothered surgeons more than the bad results from operations in cases of prolapse of the uterus, and yet it is a subject to which considerable attention and study has been given. We all know that the operations that have been made by the older men in the profession were performed because the uterus had come down, and in fact a great many women today are of the opinion that this trouble cannot be remedied. They come to us and doubt our statement when we say we can cure them. One woman I operated on a number of years ago said she wished she had known that thirty-five years before.

It has been my custom to classify these cases into two or three types. One class we take before the menopause, and the other class after the menopause. I do not think we can adopt the same operation for the cases that have not passed the menopause as for those that have. Women that have not passed the menopause are likely to become pregnant, so we have no right to sterilize them. I employ a method similar to the one that the doctor described of fixing the uterus to the anterior vaginal wall, bringing the anterior fascia together and fixing the perineum and cervix, and instead of the Baldy-Webster operation, I perform a modified operation whereby I bring the round ligaments in from the abdominal wall and fasten them, spreading them out over the fascia, seeing that there is no strangulation of the ligament, and putting three or four interrupted stitches in the ligament. In those cases we have had satisfactory results. In the cases that have passed the menopause it has been my habit in the last few years in most of these cases to fix up the perineum and vaginal wall and cervix and do a modified Murphy operation. Instead of taking the uterus and bisecting it, we completely remove the fundal portion, leaving the lateral portions to act as supports. This makes, then, firm tissue which you can lap over the recti and fascia and fixing it in a circular manner. There is considerable oozing for a few days but the final results are perfect, and those patients complain less of this operation than the Wertheim-Watkins operation. I have done a number of Wertheim operations, but the patients are not as comfortable I think as after this method. I speak of this as my own experience which has been satisfactory.

DR. A. L. MCDONALD, Duluth: In connection with these cases of prolapse of the uterus, I think the point made by Dr. Benjamin of not sterilizing these patients before the menopause is a good one. We would hesitate to sterilize them and would hesitate to fix the uterus in a woman whom we expected to bear children. I think the first essential thing is a good adequate repair of the perineum, and for that purpose the procedure Dr. Coventry described of suturing the levator muscles and securing good apposition is well adapted. In doing that one should avoid any excessive loss of blood which might lead to the formation of hematoma.

For the intra-abdominal operation I have usually done the round ligament operation of Coffey, namely, fixing the round ligaments across the anterior wall of the uterus and with that cut the layer of the broad ligament. That holds them well up. I have had two or three patients who have gone through pregnancy with the uterus still in good position.

One point in connection with the Murphy procedure of fixing the uterus to the abdominal wall is to have adequate control of the uterine blood supply. I recall seeing two or three of these operations done. I have not done the operation myself. If one in bringing up the uterus ligated the uterine arteries low down, then excised the muscularis thoroughly, bringing up two layers of muscle with very limited blood supply, there would be less disturbance of the anterior wall.

DR. COVENTRY (closing the discussion): I do not know that I have anything in particular to add to what I have already said in my paper. I do not wish you to get the impression that I am in the habit of sterilizing women who come in with prolapse of the uterus of the child-bearing age. There are not many of them that come at that time. However, if a

patient is over forty and is still menstruating, it is seriously to be considered whether it would not be advisable possibly to sterilize her when you are going to do an operation on a uterus that is badly prolapsed and hanging down between the thighs.

VERTIGO. ITS CAUSES AND THEIR DETERMINATION*

By J. A. Watson, M. D., C. M., F. A. C. S.
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Of course, we have always understood that vertigo is a symptom, not a disease. Of what it is a symptom, has been however neither clear nor uniform. To the internist it has been largely, perhaps, a symptom of intestinal absorption, arteriosclerosis, or of toxemia of various kinds, to the opthalmologist, of imbalance of the ocular muscles; to the otologist, of circulatory or other disturbances of the labyrinth. But the deeper mechanism of its production in all cases is even now perhaps but rarely understood, and seldom sought after. And yet all who investigate the subject can and must now agree to the simple statement that vertigo is a symptom of perversion of the function of the vestibular apparatus.

Vertigo has been described as "a conscious sensation of motion which is not in accordance with the facts." But it may be and sometimes is merely a sensation of confusion as to one's condition either of motion or of position without any definite sense of motion at all. Indeed this confusion may have as its dominating element a sense of rest as far as one's kinetic relationship with the external world is concerned, a sense of lack of motion, though one may be moving rapidly in a definite direction. It would then be better defined as an erroneous sensation of one's kinetio or static relationship. Such a sensation is always caused by some perversion of the function of the vestibular apparatus. But one must understand the term vestibular apparatus in a complete sense. The conscious sensation of vertigo is of course finally received and recognized in those high centers which preside over the whole kinetio-static sense or seventh sense as it is coming to be called.

Consequently, those centers are as much a part of the vestibular or kinetio-static apparatus as the centers in the cuneus which preside over the sense of sight are a part of the visual apparatus. Naturally also, all the nerve tracts which convey stimuli of whatever kind to those high centers are a part of the apparatus, and this of course includes the various ganglionic areas, or nuclei, or relay stations in which the stimuli are transferred from one part of the tract to another. The receptive end-organs in which these stimuli originate are an essential part of the apparatus. In the widest sense, this includes all the skeletal muscles which have to do with the maintenance or change of postion and the preservation of equilibrium, and the extrinsic muscles of the eyes.

But the semicircular canals and the saccule and utricle of the vestibule are much more essentially the end-organs of the kinetio-static apparatus. There is a very real and important sense in which the labyrinthine apparatus with its directly associated nerve tracts and centers takes precedence over the other organs that have to do with the kinetio-static function, a sense indeed in which it must be considered the essential seat of this function. And this is for two reasons, first, because it is devoted entirely to its purposes. It has taken time to clear away the confusion which at first resulted from that accident of evolution whereby two sense organs, viz. that of hearing, the cochlea, and that of equilibration, the vestibule and semicircular canals, are associated in one anatomical structure, the labyrinth, though just as distinct and independent in their function as are, for instance, the retina of the eye and the Schneiderian membrane of the olfactory apparatus. But it is now thoroughly understood that the cristae of the semicircular canals with the maculae of the saccule and utricle are entirely independent of Corti's organ in the cochlea, have nothing to do with the sense of hearing, and exist solely to subserve the purpose of imparting to the higher centers all necessary information in regard to position and motion. In the second place, this labyrinthine apparatus with its central ramifications is peculiarly and essentially the seat of the kinetic-static sense because under ordinary circumstances stimuli coming from other organs which have a secondary kinetic-static function to perform are referred to it for interpretation and explanation, and because it possesses a very direct and intimate con-

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trol over their physiological activity. This is perhaps best exemplified by the uniform obedience of the extrinsic eye muscles to stimuli coming to them from the labyrinthine appratus.

Under normal conditions this obedience is absolute and unvarying, and consists of turning the eyes in the direction of the endolymph flow. If, for instance, the endolymph in the horizontal canal is flowing to the right the eyes will turn horizontally to the right. If the endolymph in the anterior vertical canal is flowing from left to right the eyes will perform a coronal rotation to the right. If the endolymph in the posterior vertical canal is flowing from behind forward the eyes will rotate downward in the sagittal plane and so on. This vestibular pull of the eyes in any certain direction excites a cerebral stimulus which causes a quick jerk of the eyes in the opposite direction. It is this jerking cerebral component of the nystagmus, the movement of recovery, which designates its variety. Thus, if the vestibular pull is to the right, the nystagmus is said to be to the left because the jerking cerebral movement is in that direction.

But while this allusion to nystagmus is necessary owing to its constant physiological association with the organ of equilibrium and its very frequent clinical association with vertigo, it is with the latter of those two great and only reactions to vestibular stimulation that we are now directly concerned. There are no other reactions to vestibular stimulation. Apart from the nystagmus, all the other phenomena such as falling, past-pointing, are directly dependent on the vertigo. One falls in a certain direction because the vertigo from which he is suffering causes him to believe that he is falling in the opposite direction. He points in a certain direction past the object that he wishes to touch, because, owing to his vertigo, he believes he is moving past it in the other direction and consequently reaches back to find it.

In considering, then, the subject of vertigo one must always bear in mind the extensive ramifications and connections of the kinetic-static system. Nature, in her solicitude for the integrity of this function, has provided, not as in the case of sight or hearing, or the other special senses, merely one channel for the conveyance of impressions to the sensorium, but several channels. This solicitude is amply justified by the great necessity for its preservation. A blind or deaf man, or a man both blind and deaf can often still live a useful and happy life, but with this function it can almost be said that we live and move and have our being, and it is hardly possible to imagine life in any highly organized being without it.

With this conception of the function of the kinetic-static apparatus it is not difficult to imagine all the possible causes of vertigo. First, and as far as frequency is concerned, foremost among them is toxemia. I believe that it is not an exaggeration to say that more than one-half of all the cases seeking relief from this symptom owe their vertigo to the circulation of toxins through the vestibular apparatus; I say through the vestibular appartus, for one must remember that unless they reach some part of this system there will be no vertigo though the body should otherwise be full of them.

The remote causes, then, of toxemic vertigo are of course as varied as the causes of the toxemia that produces it. It may come from external sources as in alcoholic or many other poisonings. It may result from faulty metabolism, from the absorption of the poisonous products of imperfect digestion or of intestinal decomposition. Above all it may be from the toxemia of focal infection as in the case of infected tonsils, pyorrhea, apical abscesses, or inflammation of the accessory nasal sinuses. But are there any peculiar characteristics that enable us to distinguish toxemic vertigo from other varieties? Certainly not any which enable us to differentiate it with certainty though I cannot agree with those who state that there is never anything in the character of any vertigo that would suggest its cause, and that one is always at sea about it until one has resorted to the various tests of the vestibular function. If the vertigo is comparatively slight in degree, persistent but rather indefinite in kind without positive sensations of motion in definite directions, if there is no spontaneous nystagmus at any time even during exacerbations of the vertigo, and if the hearing in each ear is normal one would certainly be justified, especially in view of the great prevalence of toxemic vertigo over other forms, in suspecting it strongly enough to cause a search for possible sources of toxin absorption before resorting to the vestibular tests.

To this extent, only, the problem is simplified for the internist and general practioner who have neither the training nor facilities for an examination of the vestibular appartus. But one should not then conclude that because in a given case the vertigo is profound, definite in its characteristics, and even sudden in its onset, it cannot consequently be of toxemic origin. Furthermore, it should be remembered that the access of certain active toxins to the vestibular apparatus, and even the continuous circulation there of less active toxins may gradually or suddenly produce structural changes in its delicate mechanism, in which case there is another and more direct cause for the vertigo.

And indeed we will seldom or never gain any very valuable hints from the character of the vertigo itself when we attempt to differentiate between those cases due to toxemia and that large class of cases arising from circulatory disturbances. These circulatory disturbances may be general in character, disturbances in which the vestibular organs merely share as in anemia, arteriosclerosis or general circulatory insufficiency from heart disease, etc. A great deal of the indefinite dizziness complained of by elderly people is due to arteriosclerosis and when arteriosclerosis is present it may at once be suspected as the cause, though by no means accepted as such. Arteriosclerosis also often results in a definite local lesion such as a hemorrhage into the labyrinth. Or the circulatory disturbances may be due to local conditions, such as adjacent inflammations or tumors or aneurisms affecting supplying vessels. Circulatory disturbances are more likely to be accompanied by tinnitus, especially tinnitus of a more or less pulsating character, than is the case in the vertigo of toxemia.

The third cause of vertigo to be considered is imbalance or paralysis of the extrinsic eye muscles. This causes confusion of the vestibular centers on account of the conflicting sensations conveyed through the eye muscle nuclei to the vestibular apparatus by virtue of the direct connection between them, and possibly on account of conflicting impressions conveyed through association fibres between the visual center in the cuneus and the auditory center in the posterior portion of the temporal lobe. This may be suspected as a cause if the vertigo is relieved by closing the eyes and aggravated by their use. Most other forms of vertigo are apt to be aggravated by closing the eyes. An examination of the eye muscles is then in order. That form of imbalance known as cyclophoria, in which there is a tendency to rotation of the eyes either inward or outward on their antero-posterior axes is especially likely to produce vertigo, because we are especially dependent for correct orientation upon an exact parallelism of the horizontal meridian of the retina with the horizontal plane of the outer world. But very severe vertigo usually results from the apparent doubling of objects which is the result of paralysis of any of the eye muscles.

These, then, are the more important of those causes of vertigo which have their origin in organs more or less remote from the vestibular appratus proper. While they can often be conjectured by a consideration of the attendant circumtances and by an examination of the suspected organ or organs, even their certain determination depends upon a functional examination of the vestibular apparatus.

But in the second class of cases, viz.: those in which the lesion is situated in the vestibular apparatus proper, a diagnosis can never be made without an examination of its function. The lesion may be situated in the labyrinth or in any of the intracranial pathways of the vestibular portion of the auditory nerve. These pathways are now fairly well known. It would be impractical to describe them here, but it may be said briefly that after the auditory nerve enters the upper part of the medulla the three constituent portions of the nerve separate and pursue three different courses upward through the brain stem. The fibres from the vertical canals pass upward in the pons to nearly its upper part where they divide into two branches, one going through the middle cerebellar pedunele to the cerebellar nuclei, the other going through the posterior longitudinal bundle to the eye muscle nuclei. The fibres from the horizontal canals pass immediately to Deiter's nucleus in the posterior external portion of the medulla, one going through the inferior cerebellar peduncle to the cerebellar nuclei, the other passing directly to the posterior longitudinal bundle and the nuclei of the eye muscles. In each case the impulses passing to the eye muscle nuclei have to do with the pro

duction of nystagmus; those passing to the cerebellum and thence to the higher cerebral centers with the production of vertigo.

Now if it be only remembred, first, that the reactions to the vestibular tests, viz.: nystagmus and vertigo, with all the phenomena arising from the latter depend upon the circulation of the endolymph in the canals resulting from the tests, and second that we can through the tests establish the circulation at will in the canals of any plane to the exclusion of those of other planes, it will at once be seen that we have an important means of localization of the lesion causing the vertigo. If, for example, the hearing is good in the right ear and the horizontal canal of that ear responds normally to the tests for vertigo and nystagmus, but the vertical canals fail to respond, the lesion is probably situated in the pons below the point where the fibres from the vertical canals divide to go to the cerebellum on the one hand and to the eye muscle nuclei on the other. But if on the other hand the right ear be deaf and none of the right canals respond to any of the tests, the lesion is almost surely in the labyrinth itself or in the cerebello-pontine angle or in the auditory nerve before it enters the brain stem.

The tests ordinarily used are of two kinds, viz.: the rotation tests and the caloric tests. In the former the patient is rotated with his head in such a position that the canals to be tested lie in the plane of the rotation. This of course establishes the circulation of endolymph in that particular canal. In the caloric tests the ear is irrigated with hot or cold water. The endolymph in that portion of the canal under test which lies nearest the point of impact of the water becomes heated or chilled depending on whether hot or cold water is used. In the one case of course it rises, in the other sinks and in either case the circulation is thus established.

Lesions of the middle and even external ears, insofar as they are responsible for the production of vertigo may be properly considered under the heading of lesions of the vestibular apparatus itself, because these organs have something to do with the maintenance of proper pressure in the labyrinthine fluid. I have known attacks of severe vertigo to be completely relieved by the removal of impacted cerumen. Sudden increase or decrease of the pressure in the middle ear from any cause may be responsible for profound vertigo even manifesting all the characteristics of Meniere's symptom complex. The vestibular tests in the intervals will provoke perfectly normal reactions and the observer be entirely misled as to the cause of the trouble, as for instance in recurrent attacks of hyperemia of the tube and tympanic cavity. I have seen one such case referred back to the internist by the otologist with the assurance that the cause of the difficulty was not in the ear. Nevertheless, each attack was accompanied by severe tinnitus in the right ear, the hearing in that ear was markedly impaired, and immediately after each attack there was a distinct though slight redness of the drum membrane.

Finally then, and to sum up, it should be today as much the function of the otologist to determine the cause of the vertigo as to determine the cause of the deafness, and quite as much as it is the function of the opthalmologist to determine the cause of blindness. It is perhaps justifiable at times when one has not the training or facilities for making the vestibular tests to attempt a diagnosis by a process of exclusion, narrowing down the possible cause as much as possible by an examination of all the ordinary sources of vertigo outside the labyrinthine apparatus and its intracranial pathways. But such a diagnosis can rarely be final and never so without an examination of the external and middle ears and a determination of the integrity of the sense of hearing, since, on account of the close anatomical association of the organ of hearing and the organ of equilibrium, a lesion of the former in the presence of vertigo should make one doubly suspicious of a lesion of the latter.

DISCUSSION

DR. E. S. STROUT, Minneapolis: Mr. Chairman, Members of the Association: Dr. Watson is to be congratulated on his choice of a subject for the consideration of this Society, and he has given in a clear and concise manner the essential facts regarding the equilibratory apparatus.

This work is so new that it is quite probable that the profession as a whole does not as yet realize the importance of the study of vertigo, not only to the aurist but to every worker in the field of medicine.

Although the fundamental experiments were made by Flourens, nearly 100 years ago, when he noticed striking motor disturbances after sectioning the semi-circular canals in pigeons and rabbits, and that these were associated with nystagmus and vomiting,

it remained for Barany and his co-workers within the past fifteen years, to demonstrate the true function of the semi-circular canals and formulate the laws governing the kinetio-static apparatus.

Prior to that time most physiologists believed that the vestibule as well as the cochlea played some part in the hearing function. Hutchinson's Physiology published forty years ago, says that the vestibule takes cognizance of noise as distinguished from musical sound, and that the office of the semi-circular canals is in part to prevent internal echoes and reverberations.

Michael Foster in his excellent work on physiology published in 1891, states that we have reason to think that the fibers of the vestibular nerve carry impulses which are not auditory in nature, but which affect, in a special way, the movements of the body. He also says that although the vestibule may be injured without any marked effect on hearing, we are not justified in concluding that it does not in any way serve as the channel for auditory impulses. This is of interest in showing the hazy conception of the function of the semi-circular canals and vestibule held by physiologists up to very recent times.

Dr. Watson has made it clear that vertigo may not only be a symptom of a disturbance within the labyrinth, but that this disturbance may be due to disorders of the cranial cavity, or some more remote part of the body. Thus it becomes a valuable aid in diagnosis.

On the other hand the absence of vertigo and nystagmus when they should be present becomes equally important as a diagnostic aid.

I agree with Dr. Watson that the various toxemias are responsible for many cases of vertigo, and that in the milder forms there is little disturbance of hearing, but again we may have marked tinnitus and temporary impairment of hearing from involvement of cochlea as well as the vestibule even in the purely functional cases.

We must also bear in mind the toxemias which produce defininte and permanent impairment of the internal ear, such as the toxins of mumps and syphilis.

The arsenical preparation in large doses may entirely destroy the function of the labyrinth, both for hearing and equilibration. This was frequently noted during the early use of salvarsan.

One important point that I would call attention to is, that while we cannot have vertigo without nystagmus if the vestibular apparatus is intact, we may have nystagmus without vertigo.

I refer to ocular nystagmus which we so often see in persons with poor visual acuity, due to opacities in the media, such as corneal scars. These individuals are unable to fix, and as someone has said, they appear to be trying to look around the obstruction.

The movements of the eyeballs in these cases have been likened to the swing of a pendulum, the oscillations in one direction being just as large and just as rapid as in the other direction, which is as sharp contrast to the rhythmic movements of vestibular nystagmus.

Our first duty when studying a case of vertigo, is to determine whether we are dealing with a functional or an organic change in the internal ear. If the turning and caloric tests give normal reactions as to vertigo and nystagmus, we may assume that no structural change has taken place.

If, then, by further examination we can eliminate middle ear or mastoid disease as causative factors in the production of the vertigo, we know that we must look for some agency acting through the circulation or the nerve pathways upon the equilibratory apparatus in the internal ear.

Structural changes will be shown by variations in or entire loss of, vestibular reaction and these again are due to direct extension of middle ear or mastoid disease to the labyrinth, or toxic products carried to the internal ear by the blood stream or to hemorrhage or effusion.

DR. A. S. HAMILTON, Minneapolis: Chairman, Ladies and Gentlemen: I must say that my ideas are not sufficiently clear to justify me in discussing this paper. I am interested in the subject but have not been able to interpret the result with any particular satisfaction to myself in attempting to localize pathological lesions in the brain. I was closely associated with Dr. Fisher who had much to do with this subject in this community some months ago, but it did not work out very well for me. The thing I am particularly interested in is that the lesions can actually be localized by this method. I saw six cases in the Army who were all referred for tests to see if I could find any evidence of disease, they having shown certain phenomena in this way. In not one of these cases could I get anything out of it. The method may be so delicate that nothing a neurologist can do will show so early a lesion, but I could not find anything in any of the six. I know that two of them turned out to be negative cases; the other four I do not know about.

Another thing is the determination of the pathways in the brain. I do not see how anybody ever determined these pathways. It has been many years since they first started to study these lesions in the brain, and everything has been evolved by many errors and many backward steps. I have seen these moving pictures with the little bodies jumping here and there through the brain, but I do not know how they could tell from that. There is no method for studying sections histologically so far as I know, but we need the facts to show us that these pathways actually exist and that we can rely upon the knowledge that seems to come from them, especially in localization of tumors. I must say frankly that I am unconvinced as to the value of these tests so far as localization is concerned.

DR. J. A. WATSON, Minneapolis. (Closing): I can add but little to what I have already said. I agree in the main with Dr. Hamilton's remarks. I

did not intend to convey the impression that the intracanial pathways of the vestibular nerve fibres were absolutely known. Enough, however, is known about them to be of value in attempting to locate intracranial lesions in which they are involved and they have been discovered in much the same way as other pathways have been discovered. Certainly the post-mortem findings do correspond in many cases with the diagnosis that has been made from the vestibular tests. It is true that the tests often fail and no one would think of depending on them alone for the diagnosis of lesions within the head no more than they would depend on eye symptoms such as choled disc or muscle paralyses for the same purpose. This much I think is practically certain, that vertigo always indicates a disordered function of the vestibular apparatus itself either of the labyrinth or intracranial pathways, from local lesions there or from the circulation of toxins or by conflicting impressions conveyed from other sources. I wish to state that the tests as commonly employed are frequently not exact and painstaking. In many instances the investigator has not even a stop chair, the water is not of the proper temperature, etc. The water should be 68 degrees exactly and when more care is taken and the tests are more exactly carried out, we will gradually find them of more and more value in the determination of the causes of vertigo and even in the location of intracranial lesions.

INJECTION OF GAS INTO THE PERITONEAL CAVITY FOR DIAGNOSTIC AND THERAPEUTIC PURPOSES.*

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It has long been desired that we should have a brilliant method of showing the abdominal viscera, something which could be like the heart contrasted with the air filled lung, or something like the contrast one observes in pneumohydrothorax, where we have fluid contrasted with air and the compressed lung. The method of introducing gas into the peritoneal cavity makes the same or better brilliancy and contrast of the abdominal viscera than that which we have naturally in the pleural cavity.

Historical-Oxygen, as you are doubtless aware, was discovered in 1773 by Scheele of Sweden. A year later, Priesly of England made the same discovery. Shortly after that time, oxygen began to be used by inhalation for certain diseases or by putting patients up in a high altitude for tuberculosis and other pulmonary diseases. I think Bainbridge of New York City was the first in this country to use oxygen in the abdominal cavity for therapeutic purposes. He began about 1903 and carried on a large number of animal experiments relative to the use of oxygen to determine how much pressure could be borne, how many cubic centimeters could be introduced into the abdominal cavity, method of sterilization before injecting the gas, the effect on the pulse, the respiration and the blood pressure. He drew the following conclusions: Oxygen introduced into the abdominal cavity is a cardiac stimulant, also a respiratory stimulant. It brings the patient quickly out from ether anesthesia and at the same time it diminishes nausea and vomiting. He also found it maintained intra-abdominal pressure after the removal of ovarian cysts or abdominal tumors. We know that patients who have large tumors removed from the abdominal cavity go into shock because of the sudden diminution of intra-abdominal pressure and consequent bleeding into the great vessels. This can be prevented by injecting oxygen into the abdominal cavity as soon as the wound is closed and bringing the pressure up to the same point as before the operation. Oxygen introduced into the peritoneal cavity has been found useful in treating tuberculosis of the peritoneum.

The use of oxygen injected into the peritoneal cavity for diagnostic purposes is a recent discovery. The injection of gas into the pleural cavity and examination by X-ray has been used a long time. That of using it in the abdominal cavity was first introduced by Kelling who employed it in two human beings in 1902, one a case of ascites, the other a case of cancer of the stomach.

In 1910 and 1911, Jacobaeus of Stockholm revived the method, performing over twenty experiments on cadavers to determine the safety of penetrating the abdominal wall with a trocar. He was successful in demonstrating gastric cancer, general carcinomatosis and a metastatic growth in the liver. He published a monograph in 1913 describing the results of his work and showing the safety of the procedure in the living subject.

In January, 1912, Weber, working in the

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Private Institute for Roentgen Diagnosis of Eugene Weber and V. von Bergman of Kies, noticed how plainly a hypertrophied prostate was visualized when the bladder was filled with oxygen. This led to experiments on cadavers and animals, proving the method of introducing oxygen into the peritoneal cavity helpful in visualizing abdominal organs.

In the same year Lorey introduced air into the abdomen of a case of aseites after withdrawal of the fluid. He demonstrated the spleen, liver and other abdominal viscera to good advantage.

Stewart and Stein of New York began doing the same work in this country in June, 1919. They reported their results in the Annals of Surgery, July, 1919. As often happens in a new thing of this kind, more than one may be working along the same line. In January, 1919, Orndoff of Chicago, did his first case of injecting oxygen into the peritoneal cavity for diagnostic purposes. He had not found any literature and worked on it independently, so he deserves a considerable amount of credit.

Dandy of Johns Hopkins, reported an obscure case which had had a variety of diagnoses including tuberculosis. The patient had some abdominal symptoms so that an exploratory laparotomy was thought advisable. The patient stopped in the X-ray department on his way to the operating room and Baetjer made X-ray plates of his chest. In examining the plates he found they showed a beautiful image of the diaphragm contrasted with gas. Dandy took the patient into the operating room and when the incision was made in the abdomen, he found it filled with gas which had escaped thru the perforation of a large typhoid ulcer of the colon. He immediately began experimental work on diagnosis by means of air injected into the peritoneal cavity of dogs. The result of these experiments was published in the Annals of Surgery September, 1919. Before this, he had injected air into the ventricles of the brain to demonstrate brain tumors. This report was published in the Annals of Surgery, July, 1918.

Dr. Condon of Omaha, has used the injection of a mixture of air and Ringer's solution into the peritoneal cavity for a number of years for the treatment of gastro-mesenteric ileus. Pfahler of Philadelphia, has been using the injection of oxygen into the bladder for diagnostic purposes more than twelve years. This, together with the injection of air into the abdominal cavity, makes it possible to demonstrate the actual thickness of the bladder wall and to reveal tumors when very small.

Technique—One must sterilize the abdominal wall just as carefully as when doing a laparotomy. We use a dental oxygen tank. To this is connected a rubber hose and a spinal puncture needle which has had the point filed blunt. The site of choice for injection is in the midline below the navel, keeping close up to the navel to avoid puncture of the distended bladder. If a scar exists in the midline, one can go thru any other part of the abdominal wall desired. Oxygen is flowed slowly in till the liver dullness is obliterated and the patient complains of feeling full. After air has been introduced, one has to work out a position for bringing the abdominal viscera into view in contrast with the gas. This can best be worked out by having a horizontal table in front of the vertical fluoroscope so that one is looking at the patient laterally with the abdomen up, and as the gas is injected into the peritoneal cavity, the abdominal wall is lifted up and one can see the abdominal viscera contrasted with air. We know when we have injected a sufficient amount by the patient complaining that there is a feeling of fullness. Then we take the needle out and put the patient in the correct position which will reveal the pathology and make plates in this position. This makes it possible for us to actually see adhesions of the viscera to the parietal peritoneum which we were unable to do before by the ordinary method of examination with the opaque meal. Because the cecum was not freely movable, we could infer that adhesions existed, but by this method we can positively demonstrate them.

In place of showing the lower pole of the kidney only, by this method one can show the entire kidney, the entire liver, the entire spleen, and one plate showed the folds of a soft spleen. The injection of oxygen into the peritoneal cavity, together with a gas filled

stomach, enables one to actually demonstrate the thickness of the stomach wall and to visualize gastric tumors and new growths. In some cases, one even gets a very clear image of the gallbladder itself. Air introduced into the bladder and the peritoneal cavity shows the bladder wall, making it possible to visualize tumors when very small. One can visualize the prostate, the pelvic viscera in the female, showing increase in size of the uterus so that pregnancy can be recognized earlier than formerly. Peritoneal tumors can also be shown.

The dangers—First, infection which can be avoided by surgical asepsis. Second, the injection of gas into the subcutaneous tissue. Since absorption quickly takes place, there is no danger unless too much is put in and the distention tears the subcutaneous structures. Third, overdistention of the patient. If one overdistends them the pressure ratio between the thorax and abdomen is changed, causing embarrassment to respiration. Fourth, we may allow the patient to assume the upright position too soon after the injection.

After care—The patient must be kept in the horizontal or Trendelenburg position for twenty four hours. The gas always stays on top no matter what position the patient is in. When erect the gas gets up under the diaphragm, pushing the liver downward, causing a pulling on the supensory ligament with pain in the neck and dyspnea. This causes the patient to want to sit up, thus increasing the distress. By turning the patient upside down, immediate relief is obtained. One must insist on the horizontal position.

Absorption time—The time for the absorption of oxygen in the peritoneal cavity is about thirty-six hours; for carbon dioxide, thirty minutes; air, which is a mixture of oxygen and nitrogen, four to seven days; pure nitrogen, seven to fourteen days.

Up to date, I have used this method of diagnosis in thirty-six different cases. I have found it of great value in making positive diagnosis of adhesions, early uterine enlargement, positive diagnosis of gastric tumors and of gallstones, and it makes it possible to visualize the entire kidney, ovaries and tubes.

Since this method of diagnosis has been used, a new therapeutic use has been found by filling the abdominal cavity with gas to prevent the formation of adhesions between raw surfaces. In order to accomplish this, the oxygen should be injected just before the last stitch is taken in closing up the wound or the needle may be inserted thru the abdominal wall as is done in the usual technique for diagnosis. The abdomen should be distended up to the safety pressure point then the patient should be kept continuously for three or four days in the position which will separate the abdominal wall farthest from the site of the adhesions. One can check up following the operation and see whether adhesions reform.

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BLOOD TRANSFUSION AND THE RESULTS THAT MAY BE EXPECTED*

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Although blood transfusion is by no means a new procedure there is still much to be worked out and perfected before it can be considered beyond its infancy. Whether this slow development is due to a lack of confidence in its merits or the want of a really satisfactory technique for the administering of this valuable adjunct as a therapeutic measure, is something difficult to determine.

It seems now that the decidedly bad effects that are liable to be encountered, and which cause us to dread a blood transfusion, are almost entirely due to faulty technique and have little or nothing to do with haemolysis or agglutination. It also seems that there must be something wrong with the showing of Moss that practically all people are divided into four groups as regards their blood, and that only those should serve as donors whose blood is in the same group as that of the recipient. In a series of one hundred and forty cases, seen during a period of the four years from 1915 to 1919 no ill effects were observed although no discrimination was used in the selection of the donors. In only eighteen cases was the donor a relative of the recipient while the remainder received the blood from the wives, husbands, friends and hired donors. Numerous unpublished reports from all over the country are in accord with this statement and it should not be long before something definite will be brought out along this line.

In the series of cases between 1915 and 1919 anticoagulants were employed in all the work. Hirudin was the anticoagulant in ten cases and sodium citrate was used in the remainder. This rather limited experience, free from any misfortune whatever, has caused us to have utmost confidence in this method and to recommend it as the one of choice.

Sodium citrate must be given the first place as an anticoagulant as it fulfils all the requirements and is less toxic than hirudin. Two-tenths of one per cent sodium citrate solution in accordance with the method of Lewisohn is employed in our work.

Certain things should be kept in mind, however, when a blood transfusion is performed. The donor must be a healthy individual, free from syphilis, gonorhea, tuberculosis, or any other serious ailment. The blood should be given slowly and kept at a temperature of one hundred degrees. To facilitate this we devised a special apparatus in 1915 which has up to this time, not found its way onto the market. This apparatus is a glass tube, somewhat like the one devised by Percy, with a capacity of five hundred cubic centimeters and constructed of quite heavy glass and is encased in a second equally heavy glass tube with a capacity of seven hundred cubic centimeters. The outer tube has an opening at the upper end which can be closed with an ordinary cork stopper after the compartment has been filled with water of a temperature of 101 degrees. The upper end of the inner tube has a slip-on point for a rubber tubing with bulb attached. The lower end of the inner glass is drawn to a finer point than the upper and to this is attached a small rubber tube with a luer tip for the needle. It also has a cut-off so the flow

*Read before the Sioux Valley Medical Society, Sioux City, Iowa, Jan. 21, 1920.

of blood may be stopped or regulated as desired.

This apparatus has been in use for four years and has given most gratifying results. It tends to eliminate many of the disagreeable effects that are so liable to make themselves felt during the preformance of a blood transfusion.

When the blood is being drawn into a vessel and mixed with the anticoagulan solution it has an opportunity to cool considerably but the water coat of 101 degrees brings it back to a temperature of about 100 degrees soon after it is placed in the tube. It is wonderful how much the warming of the blood adds to the patient's comfort as well as adding ease to the performance of the operation.

The blood is kept under a constant pressure with the bulb on one end of the tube and the cut-off on the other. This eliminates the annoyance of stoppage of the flow which frequently occurs, even with citrated blood, when the gravity method is used.

The blood should be drawn with a needle and also given with a needle in one of the largest veins that presents itself at the bend of the elbow. The only marks indicating that an operation was done should be a needle puncture on the arm of the donor and on the recipient except in cases of prenicious anemia, when intending to give a large amount of blood ,a quanity of the watery contents is withdrawn from the other arm.

A series of thirty cases under our care previous to 1915 received transfusions of blood that was not treated with anticoagulants. These were given by the direct and indirect methods with varying results. One patient died during the operation. At postmorten small clots or thrombi were found at the bifurcations of many of the large arteries, while some of the small arteries were completely obliterated. These thrombi may have been due to agglutination but it would probably be just as correct to assume that they were the result of coagulation. In others of this series some very peculiar symptoms were observed. Some of the most marked were violent headache, rise in temperature, retinal congestion, edema of the glottis and uvula, extreme nervousness and violent twitching simulating convulsons. None of these bad effects have been encountered since resorting to the use of blood treated with anticoagulants.

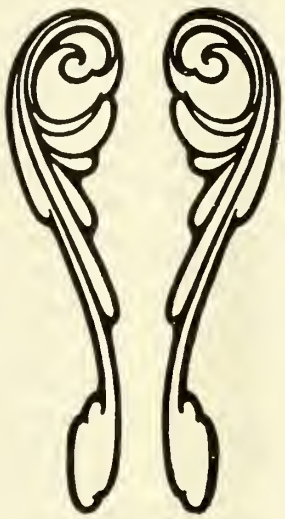
Very gratifying results may be anticipated and are often obtained in any form of anemia, purpura or hemophilia. In fact any abnormal blood condition will yield in degrees from slight benefit to complete recovery. It appears, however, that blood transfusion is not as valuable in severe acute hemorrhages as is generally anticipated. Where there has been a loss of an abundance of blood a great deal more can be accomplished by transfusing a considerable quantity of normal salt solution than by waiting and performing blood transfusion. To prepare to give blood nearly always necessitates some delay. A salt solution can be quickly given and will do much to tide the patient over for a blood transfusion later.

Probably the greatest satisfaction is attained when blood transfusion is used as a treatment adjunct for pernicious anemia. In our work sixty cases of this affection were treated in this manner between 1915 and 1919 three proving fatal. One of these cases had a red blood count of 800,000 per cubic millimeter when treatment began. The other two fatal cases each had a count of 1,000,000 red blood cells to the cubic millimeter at the time they came under our observation. The lowest fall of the count in these cases that recovered was 1,200,000 per c.m.m. In spite of the small number of patients treated, figures like these are important for the reason that they show that to obtain the best results, treatment should not be delayed too long.

In our cases the amount of blood given at the first operation was usually 1000 cubic centimeters, with the letting at the same time of about 700 c.c. of the anemic contents from the vein in the opposite arm. The withdrawing of blood was not repeated at subsequent transfusions which were usually performed at three day intervals.

Counts were made every three hours after transfusion was made and at the end of the first three hours after the initial transfusion a rise in the number of corpuscles of between 30,000 to 50,000 was found in most of the

cases. After the first three hours the rise was less marked, ranging from a decrease to as high as 20,000 increase. This condition, with possibly a slight increase in numbers, existed until the next transfusion three or four days later. Then practically the same changes took place as those following the first operation except that there was no fall in the count at the end of the first three hours and the increase was more pronounced after that.



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Vol. III Juue, 1920 No. 6

EDITORIAL

MEDICAL PLAGIARISM

Plagiarism is defined as "the appropriation or giving out as one's own the literary or artistic work of another". A polite term for theft, then. And plagiarism occurs too often in the field of medicine and cannot be too severely condemned.

Few ideas are original if we accept Kant's view that the source of man's knowledge is experience. Few individuals have the inventive type of mind. Most of us pick and choose from the ideas and inventions of others. And most of the new ideas do not stand the test of time.

Medical literature is largely composed of old ideas presented in new form or in different combinations. What an economy would be effected if only strictly new medical matters were published. And yet this rehashing of ideas and the recording of one's experience has the same value as discussion in general.

An author would have some difficulty ofttimes in giving his authority for numerous ideas expressed. One need not be absurd in his conscientious endeavor to give honor where honor is due. The boundary line of plagiarism is generally clear cut and can be determined by the application of the Golden Rule.

You do not want another to quote sentences or whole paragraphs from you simply exercising a more or less liberal editorial prerogative. You much prefer that your name be mentioned and quotation marks retained, even though your literary style may not be of the best. If you have actually invented some diagnostic procedure or mechanical device it would be galling to have your idea stolen and presented by another.

No international police as yet exists and the chance of detection is apparently judged to be less, the farther away the stolen goods are carried. The world is not so large after all.

TONSILS AND TEETH.

The crux of the tonsil and tooth question is not so much whether definitely diseased tonsils or abscessed teeth should be removed but when does pathology in these organs warrant removal.

About a decade ago attention was called by laboratory investigators to the etiological relation of infections of the tonsils to a host of morbid processes in other organs. War was declared on the tonsil and tonsils were more often than not removed because they "looked bad" to the specialist. Occasionally hidden diseased tonsillar foci were found and this possibility loomed up in every case examined and tonsils were slaughtered largely because they were tonsils, the anamnesis as likely as not being ignored.

The medical profession first called attention to the importance of diseased tooth roots as foci of infection. The dentist was called upon to remove abscessed roots in the interest of the patient's general health. He balked, being naturally loath to tear down his bridge work and remove his crowns. But what a change in the attitude in the dental profession. Dental surgeons, zealous to assist the medical profession, arose like mushrooms. In case of doubt, extract—became their motto. Some dentists became so conscientious that they refused to fill a dead tooth and referred such cases to men that would. The onslaught on teeth outdid that on the tonsil. The question has been and still is a difficult one, notwithstanding our remarks.

There is no doubt but that the medical profession is now trying to modify the attitude of

the extremists in the dental profession on the extraction problem. In fact the pendulum has begun to swing back toward its position of rest. Probably fewer tonsils are being removed of late just as in the case of appendix.

In an effort to put the brake on this backward swing of the pendulum and bring us as a profession to that ultimate moderate view point, attention is called to some very interesting observations recently made by no less an authority than Dr. Alexander Lambert of New York, regarding the prevalence of acute rheumatic fever at Bellevue Hospital. His careful survey leaves no room for doubt but that there has been a marked decrease in the number of these cases during the past few years, the last two particularly. He feels that the attention directed to both tonsils and teeth is to be credited with this result. Not tonsils alone, as this reduction though more marked in the age period 20 to 29 is not confined to this period. This is the period affected by tonsillectomy in children, a popular proceeding only during the last ten years.

If an individual has a repeated tonsillar infection at a comparatively short interval, the tonsils should come out. If the dentist finds an abscessed tooth root the extraction should be performed and the socket curetted. The question, abscess or no abscess should be determined by the dentist. The dark circular area of deeper x-ray penetration about a tooth root should not be the only consideration. Shadow projection is tricky at times. The vitality of the tooth is an important consideration and each case should be considered on its own merits with due regard for disease elsewhere. Temporizing measures however, simply postpone extraction and are dangerous.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MID-SUMMER SESSION SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Fairmont, Minnesota, June 28-29, 1920

OFFICERS

Dr. H. Z. Giffin, Pres., Rochester, Minn.
Dr. Archa E. Wilcox, 1st V. P., Minneapolis, Minn.
Dr. W. J. Richardson, 2nd V. P., Fairmont, Minn.
Dr. H. T. McGuigan, Sec., Red Wing, Minn.
Dr. G. F. Merritt, Treas., St. Peter, Minn.
Mr. William Whitford, Official Reporter, Chicago.

ANNOUNCEMENTS

The afternoon session will convene Monday, June 28th at 2:30 o'clock P. M. at the auditorium High School Building.

The banquet will be held Monday evening, Gymnasium High School Building, at 6:30 P. M.

Please make your reservations for plates and hotel accommodations at once by addressing Dr. W. J. Richardson, Chairman, Committee of Arrangements, Fairmont, Minnesota.

The Automobile Tour will be given Tuesday afternoon, June 29th. Hour to be announced later.

The Luncheon by the Physicians and Citizens of Fairmont will be tendered Tuesday, June 29th. Hour to be announced later.

The Fairmont Golf Club has Reserved the Golf Links for the exclusive use of Visiting Physicians and their Friends, Monday forenoon, June 28th, Tuesday afternoon, June 29th and Wednesday, June 30th.

Physicians and Ladies desiring to participate in the Golf Tournament should communicate with Mr. Troy Himmelman, Fairmont, Minnesota.

All railroads making Fairmont will carry special coaches on all regular passenger trains, Monday, June 28th. Schedule of train service will appear in the Official Program, June 15th, 1920.

Application for membership in the Southern Minnesota Medical Association may be made to Dr. H. T. McGuigan, Red Wing, Minn.

AFTERNOON SESSION

AUDITORIUM HIGH SCHOOL
MONDAY AFTERNOON, JUNE 28, 1920
2:30 O'CLOCK P. M.

1: Fracture Sprain (Lantern.)—Dr. A. E. Sohmer, Mankato, Minn.

Discussion:—Dr. A. R. Colvin, St. Paul, Minn.; Dr. M. H. Cremer, Red Wing, Minn.

2. Ocular Imbalance (Heterophoria.)—Dr. J. H. James, Mankato, Minn.

Discussion:—Dr. John Fulton, St. Paul, Minn.; Dr. Jehiel Chamberlin, St. Paul, Minn.

3. A Consideration of Late Sequela Following Gastroenterostomy, With Special Reference to Gastrojejunal Ulcer—Dr. George Eusterman, Rochester, Minn.

Discussion:—Dr. Hugh S. Willson, Minneapolis, Minn.; Dr. E. L. Tuohy, Duluth, Minn.

4. Mechanics of Digestion—Dr. Charles N. Hensel, St. Paul, Minn.

Discussion:—Dr. C. P. Robbins, Winona, Minn.; Dr. R. M. Wilder, Rochester, Minn.

5. Chronic Interstitial Nephritis in Children—Dr. Rood Taylor, Minneapolis, Minn.

Discussion:—Dr. L. G. Rowntree, Minneapolis, Minn.; Dr. N. O. Pearce, Minneapolis, Minn.; Dr. R. N. Andrews, Mankato, Minn.

6. Treatment Acute Septic Arthritis—Capt. Vandervelt, La Panne, Belgium.

Discussion:—Dr. A. A. Law, Minneapolis, Minn.; Dr. Wallace Cole, St. Paul, Minn.

EVENING SESSION

AUDITORIUM HIGH SCHOOL

MONDAY EVENING, JUNE 28, 1920

6:30 O'CLOCK P. M.

Address of Welcome—Mayor J. E. Edwards.

Response—Dr. W. A. Jones, Minneapolis, Minn.

Invocation—Rev. F. S. Fredrickson, Fairmont, Minn.

Banquet.

7. Differential Diagnosis of Bronchiectasis, Lung Abscess and Encapsulated Empyema—Dr. C. P. Howard, Iowa City, Iowa.

Discussion:—Dr. C. A. Hedblom, Rochester, Minn.; Dr. J. P. Schneider, Minneapolis, Minn.

8. Methods of Education in South America, with Observations on the Universities, Hospitals, Surgical Clinics and Surgeons—Dr. William J. Mayo, Rochester, Minn.

9. Diagnosis and Treatment of Acute Anterior Urethritis (Lantern.)—Dr. Lewis Wyne Bremerman, Chicago, Ill.

Discussion:—Dr. S. E. Sweitzer, Minneapolis, Minn.; Dr. Paul Cook, St. Paul, Minn.

10. Ankylosis of the Jaw (Lantern.)—Dr. Harry P. Ritchie, St. Paul, Minn.

Discussion:—Dr. G. B. New, Rochester, Minn.; Dr. A. L. Mann, Minneapolis, Minn.

TUESDAY, JUNE 29, 1920

8 O'CLOCK A. M.

11. Diabetes Mellitus—Dr. L. G. Rowntree, Minneapolis, Minn., Professor of Medicine, University of Minnesota.

Discussion:—Dr. James Gilfillian, St. Paul, Minn.; Dr. Marx White, Minneapolis, Minn.

12. Pre and Post-Operative Medical Considerations in Diabetes with Surgical Complication—Dr. D. M. Berkman, Rochester, Minn.

Discussion:—Dr. J. W. Little, Minneapolis, Minn.; Dr. Harry B. Zimmerman, St. Paul, Minn.

13. Tuberculosis of Knee Joint in Children—Dr. M. S. Henderson, Rochester, Minn.; Dr. H. W. Meyerding, Rochester, Minn.

Discussion:—Dr. Emil S. Geist, Minneapolis, Minn.; Dr. A. J. Gillette, St. Paul, Minn.

14. Sensory Changes in Pernicious Anaemia—Dr. Arthur S. Hamilton, Minneapolis, Minn.

Discussion:—Dr. H. W. Woltman, Rochester, Minn.; Dr. E. M. Hammes, St. Paul, Minn.

15. The Organization of Medical School and Hospital Facilities for Graduate Medical Education—Dr. L. B. Wilson, Rochester, Minn.

Discussion:—Dr. E. P. Lyon, Dean University Medical School, Minneapolis, Minn.

Committee on Arrangements

Dr. W. J. Richardson, Fairmont, Minn., Chairman.
Dr. H. P. Johnson, Fairmont, Minn.
Dr. George W. Dewey, Fairmont, Minn.

Reception Committee

Dr. G. H. Luedtke, Fairmont, Minn., Chairman.
Dr. F. N. Hunt, Fairmont, Minn.
Dr. R. C. Lowe, Fairmont, Minn.
Dr. R. C. Farrish, Sherburn, Minn.
Dr. P. F. Holm, Wells, Minn.
Dr. C. J. Holman, Mankato, Minn.
Dr. W. C. Portman, Jackson, Minn.

Executive Committee

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Dr. C. P. Robbins, Winona, Minn.
Dr. W. H. Rowe, St. James, Minn.

Committee on Nominations and New Members

Dr. J. H. Adair, Owatonna, Minn., Chairman.
Dr. M. S. Henderson, Rochester, Minn.
Dr. W. H. Condit, Minneapolis, Minn.

Program Committee

Dr. A. F. Schmitt, Mankato, Minn., Chairman.
Dr. H. W. Meyerding, Rochester, Minn.
Dr. E. M. Hammes, St. Paul, Minn.

SIOUX VALLEY MEDICAL ASSOCIATION

The twenty-fifth annual session of the Sioux Valley Medical Association will be held in Sioux Falls, South Dakota, June 23 and 24, 1920.

PROGRAM

JUNE 23, 1920

Cardiac Diagnosis. Dr. E. W. Meis, Sioux City, Iowa.

Cardiac Asthenia. Dr. V. W. Embree, Yankton, South Dakota.

Subject to be announced. Dr. J. C. Ohlmacher, Vermilion, South Dakota.

Xray Study of War Fractures and Osteomyelitis. Dr. N. J. Nessa, Sioux Falls, South Dakota.

Empyema. Dr. P. E. Sawyer, Sioux City, Iowa.

President's Address. Dr. A. E. Spalding, Luverne, Minnesota.

The Sioux Valley Medical Association. Dr. J. N. Warren, Sioux City, Iowa.

Diagnosis and Treatment of Weak and Flat Feet. Dr. W. E. Wolcott, Omaha, Nebraska.

Tibial Bone Defects, Congenital and Acquired. Dr. J. P. Lord, Omaha, Nebraska.

Cystoscopy in General Abdominal Diagnosis. Dr. C. T. Maxwell Sioux City, Iowa.

A Few Interesting Cases. Dr. L. J. Townsend, Sioux City, Iowa.

JUNE 24, 1920

Traumatism and Transplantation in Cancer. Dr. D. T. Quigley, Omaha, Nebraska.

Gastric Ulcer and Gastric Malignancy. Dr. J. W. Shuman, Sioux City, Iowa.

Practical Infant Feeding without Breast Milk. Dr. F. Clark, Omaha, Nebraska.

Child Welfare. Dr. G. E. Limmerman, Sioux Falls, South Dakota.

Great Men in Medicine. Dr. J. H. Darey, Sioux City, Iowa.

Banquet at Hotel Cataract, Wednesday, June 23, 1920 at 7 P. M.

OFFICERS

President, Dr. A. E. Spalding, Luverne, Minn.

Vice-President, Dr. E. A. Jenkinson, Sioux City, Iowa.

Second Vice-President, Dr. T. J. Billion, Sioux Falls, South Dakota.

Secretary, Dr. J. A. Dales, Sioux City, Iowa.

Treasurer, Dr. W. R. Brock, Sheldon, Iowa.

COMMITTEE OF ARRANGEMENTS

Drs. G. G. Gottam, F. I. Putnam, N. J. Nessa, Sioux Falls, South Dakota.

NEW AND NON-OFFICIAL REMEDIES

During April the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Abbott Laboratories:
- **Anesthesin-Abbott**
- **Aromatic Chlorazene Powder.**
- **Tablets Dichloramine-T-Abbott.**

Diaprotein Company:
- **Diaprotein Prepared Casein Flour.**

Gilliland Laboratories:
- **Streptococcus Vaccine (Gilliland).**

Heyden Chemical Works:
- **Acetylsalicylic Acid-Heyden.**

Hollister-Wilson Laboratories:
- **Capsules Corpora Lutea Desiccated-Hollister-Wilson.**
- **Tablets Corpus Luteum Desiccated-Hollister-Wilson.**
- **Pituitol Obstetrical.**
- **Pituitol Surgical.**

Lederle Antitoxin Laboratories:
- **Pollen Antigen-Lederle (Spring Type).**

Lowy Laboratory, Inc.:
- **Solution Arsphenamine-Lowy.**

Radio Chemical Corporation:
- **Radium Bromide (Radio Chemical Corp.)**
- **Radium Carbonate (Radio Chemical Corp.)**
- **Radium Chloride (Radio Chemical Corp.)**
- **Radium Sulphate (Radio Chemical Corp.)**

E. R. Squibb & Sons:
- **Bacillus Bulgaricus-Squibb.**

Bacillus Bulgaricus-Squibb.—A culture in vials of the bacillus bulgaricus type A, the bacillus bulgaricus type B (bacillus acidophilus) and the bacillus paralacticus, each vial containing 12 Cc. The preparation is designed for internal administration and for topical application (see general article, Lactic Acid-Producing Organisms and Preparations, New and Nonofficial Remedies, 1920, P. 156). E. R. Squibb & Sons, New York.

Pollen Antigen-Lederle (Spring Type).—A liquid obtained by extracting equal parts by weight of dried pollens of timothy, red top, June grass, orchard grass, sweet vernal grass, meadow foxtail, meadow fescue, rye and wheat by a vehicle of 67 per cent glycerine and 33 per cent saturated solution of sodium chloride. Each Cc. contains 14,000 pollen units (a pollen unit is the equivalent of 0.001 Mg. of pollen). For a discussion of the actions, uses and dosage, see Pollen Extract Preparations, New and Nonofficial Remedies, 1920, p. 236. The product is supplied in 15 different doses, each dose consisting of 0.1 Cc. of the respective dilution. Each dose is accompanied by a vial containing 9 Cc. of sterile water for diluting the dose to make it of isotonic strength. Pollen Antigen-Lederle (Spring Type) is supplied in packages containing a complete set of 15 doses, in packages containing sets of 5 doses and as a diagnostic test consisting of 0.01 Cc. of No. 15 dilution. Lederle Antitoxin Laboratories, New York (Jour. A. M. A., April 24, 1920, p. 1167).

PROPAGANDA FOR REFORM

Some Misbranded Nostrums.—The following "patent" medicines have been the subject of prosecution by the Federal authorities: Mendenhall's No. 40 for the Blood, consisting essentially of potassium iodid, cathartic resins, ammonium acetate, licorice, glycerin, sugar, alcohol and water; Zaegel's Essence, consisting essentially of alcohol, water, sugar and plant extractives, including a laxative substance and a saponin; Zaegel's Lung Balsam, consisting essentially of alcohol, water, sugar and laxative plant material flavored with oil of peppermint; McGraw's Liquid Herbs of Youth, containing essentially Epsom salt, senna, red pepper, quassia, alcohol and water with wintergreen flavor; Jarabe de Abrozoin, composed essentially of terpin hydrate, menthol, benzoic acid, ammonium chlorid, sodium bromid, glycerin, alcohol, sugar and water; Kampfmueller's Rheumatic Remedy, consisting essentially of potassium iodid, plant extractives, alcohol and water; Sal-Sano, containing essentially sodium chlorid, sodium phosphate, sodium bicarbonate and sodium sulphate; Indian Wyanole, consisting essentially of chloroform, ammonia, menthol, glycerin, turpentine-like oils, alcohol and water;

Gregory's Antiseptic Oil, consisting of kerosene oil with oil of cloves, cassia, and sassafras with a trace of camphor and pepper resins (Jour. A. M. A., April 17, 1920, P. 1114).

Look Up Its Rating.—The Council on Pharmacy and Chemistry was created because the complexity of modern medicine makes it a physical impossibility for physicians to know the scientific status of the many proprietary remedies which are on the market. As commercial agencies, such as Bradstreet and Dun, report on the commercial probity of individuals and firms, so the Council on Pharmacy and Chemistry reports on what might be called the scientific probity of proprietary and unofficial pharmaceutical products. The commercial agency issues, at no small expense to its customers, rating books; the Council on Pharmacy and Chemistry issues, at a nominal price, "New and Nonofficial Remedies". The commercial agency, for a substantial fee, will furnish reports on business concerns; the Council on Pharmacy and Chemistry, will without any expense to the profession, furnish reports on proprietary products used for the relief or cure of human ailments (Jour. A. M. A., April 24, 1920, p. 1171).

Adulterated or Misbranded Mineral Water.—Harris Spring Water, examined by the U. S.. Bureau of Chemistry, was found to contain B. coli in small quantities, molds and liquefying organisms. Sprudel Concentrated Spring Water was found to contain bacilli of the colon group and also added salts not obtained from the West Baden Springs. American Apollinaris Mineral Water was found not to be Apollinaris Water. Robinson Spring Water was falsely claimed to be effective as a remedy for Bright's disease, diabetes, dropsy, cystitis, gout, rheumatism, indigestion, and kidney and bladder troubles. Ferro-Manganese Regent Water was falsely represented as a remedy for alcoholism, chronic rheumatism, dyspepsia, diabetes, Bright's disease, albuminuria, dropsy, sciatica and insomnia, and was not a natural spring water (Jour. A. M. A., April 24, 1920, p. 1182).

Alkalithia.—Keasbey and Mattison Company's Effervescent Alkalithia was introduced at a time when it was believed that the administration of lithium salts served to remove uric acid from the system. The A. M. A. Chemical Laboratory reported that Alkalithia is an effervescent mixture which contains alkaline carbonates and bicarbonates together with caffein, free tartaric acid and free citric acid and that, as taken, it represents caffein in solution of alkali tartrate, citrate and bicarbonate containing free carbonic acid. The Council on Pharmacy and Chemistry declared Alkalithia inadmissible to New and Nonofficial Remedies because the claims made on the label and in the circular accompanying the trade package led the public, to its detriment, to depend on this preparation and because the therapeutic claims are unwarranted (Reports Council Pharm. & Chem., 1919, p. 65).

Arhovin Omitted from N. N. R.—Arhovin is a solution of diphenylamin, thymol benzoate and ethyl benzoate marketed by Schering and Glatz, Inc. The Council on Pharmacy and Chemistry reports that it was omitted from New and Nonofficial Remedies because the therapeutic claims made for the preparation were unwarranted (Reports Council Pharm. & Chem., 1919, p. 66).

Chloron, Chlorax and Number "3".—The Council on Pharmacy and Chemistry has examined Chloron, Chlorax and Number "3", manufactured by the Chlorine Products Company, Inc., New York. The products have been declared inadmissible to New and Nonofficial Remedies. The report of the Council—which in accordance with the usual procedure was submitted to the Chlorine Products Company before its publication was authorized—sums up the Council's findings thus: (1) All are of unreliable composition. (2) The therapeutic claims made for the preparations are not substantiated by evidence and are unwarranted and misleading. Chloron is inferior as an antiseptic to the well-known surgical solution of chlorinated soda because of its low chlorin content and uncontrolled reaction. There is no warrant for the claim that Chlorax is useful in the treatment of "Kidney Conditions", "Diabetes", "Acute Infections", "Blood Dicrasias", "Lithemias" and "Rheumatism", and "Nervous Conditions", nor is there warrant for the claim that "Number '3' " is a "blood purifier" or a "syphilis remedy". (3) The names of these pharmaceutical mixtures are not descriptive of their composition. (4) All three preparations are irrational. No evidence has been furnished that the lithium salt is of value in the mixtures. It is not rational to combine an active chlorin preparation and a mercury salt in one mixture, nor is there evidence that the addition of opium to the preparations proposed for internal use is of value or rational. Experimentation with Number "3" as a "syphilis remedy" is to be severely condemned in that those on whom it is used will, in the meantime, be deprived of efficient medication (Reports Council Pharm. & Chem., 1919, p. 70).

Elarsen Omitted from N. N. R.—Elarsen, now sold by the Winthrop Chemical Co., Inc., was formerly sold in the United States by the Bayer Co., Inc. It was admitted to New and Nonofficial Remedies in 1914. The Council on Pharmacy and Chemistry now reports that Elarsen has been omitted from New and Nonofficial Remedies because it is sold under unproved and, consequently, unwarranted claims and because, in the light of investigation, it is an unscientific and relatively useless article. The Council also reports that Elarsen has not been shown to have advantages over Fowler's solution but that, in some respects at least, it is inferior (Reports Council Pharm. & Chem., 1919, p. 75).

Formicin Omitted From N. N. R.—Formicin, manu-

factured by Kalle and Co., A. G. Biebrich A RH, Germany (Kalle Color and Chemical Co., New York, U. S. agents) was admitted to New and Nonofficial Remedies in 1912. The Council on Pharmacy and Chemistry reports that while the claims recently made for Formicin were essentially those made when the product was first accepted, these claims were questioned because further experience had not established the usefulness of the product. As the Kalle Color and Chemical Co. presented no evidence to establish its therapeutic efficiency, the Council directed the omission of Formicin from N. N. N. (Reports Council Pharm. & Chem., 1919, p. 76).

CORRESPONDENCE

Ductless Gland in U. S. Soldiers During the European War

Army Medical Museum, Washington, D. C.
May 11, 1920.

To the Editor:

Being interested in material on diseases of the glands of internal secretion in U. S. soldiers in our army camps and at the front during the European War, I should feel much indebted to any physician who has served as a medical officer in the Army during the war, who might be able to supply me with any information in regard to this matter, particularly statistical relations, comeiology, the incidence of these diseases in drafted men and in enlisted men who were subsequently on duty, and the measures taken in dealing with such cases. Any help I may receive in this matter will be highly appreciated and acknowledged.

James Robb Church,
Colonel, Medical Corps, U. S. Army,
Secretary-Treasurer.

OBITUARY

DR. HERBERT S. HILL.

Dr. Herbert S. Hill, formerly of Owatonna, died April 1st at his home in Springfield, Mo. He was 77 years of age, and was born at Buxton, Me. He was a graduate of the Rush Medical College. After graduation he practiced medicine at Elkader and Dubuque, Ia., moving to Owatonna in 1873. In 1884 he moved to Springfield, Mo., where he has since made his home. His widow and one brother survive him.

DR. L. A. DAVIS.

Dr. L. A. Davis of Wadena died on April 22. He was born at Harnesville, Pa., June 19, 1878, and came to Minnesota with his parents in 1882, when they settled at Howard Lake, and there he received his early education. In 1901 he graduated from the medical school of the University of Minnesota and took his interne work in the Norwegian Deaconess Hospital in Minneapolis, after which he took up practice at Dalton. A short time after locating at Dalton, Dr. Davis moved to Wadena where he has practiced since. He is survived by his widow and three children.

DR. BENJAMIN F. MOTT.

Dr. Benjamin F. Mott died at his home in Minneapolis at the age of 60 years. Dr. Mott was a graduate from the Eclectic Medical College of Cincinnati in 1874. About twenty-five years ago he practiced in Lake City.

DR. JOHN STEINBACH.

Dr. John Steinbach died at his home in Winona on April 28th at the age of 64. He was a well known oculist and has practiced in Winona for twenty-nine years. He is survived by his widow and two children.

DR. ALFRED WHARTON.

Dr. Alfred Wharton, aged 84 years, died at the residence of his daughter Mrs. John W. Willis, 923 Summit Ave., St. Paul, on April 13, 1920. Dr. Wharton graduated at the University of Pennsylvania in 1857 and came to St. Paul shortly after graduation, arriving on the same boat as the late Dr. D. W. Hand. Dr. Wharton practiced his profession in St. Paul from that time till he retired from active practice in 1885, though for some years after that he did some office consultation and was medical examiner for several life insurance companies.

He was associated at different times with Dr. W. H. Morton, a prominent surgeon here in the late fifties and sixties of last century, Dr. John H. Murphy and Dr. Samuel Willey. Dr. Wharton also served as surgeon to the 6th Minnesota Infantry having been appointed to that position by Governor Ramsey in 1862. Dr. Wharton's death removed from St. Paul the last of our profession who practiced here in the pioneer days. He was a member of the old St. Paul Academy which organization flourished about the period of the Civil War and also was one of the founders of our present State Medical Association and of the Ramsey County Medical Society, having been vice president of the former and president of the latter. Of the original group of men who organized the Ramsey County Medical Society but three now remain, Dr. Samuel D. Flagg, who came here in 1868, Dr. Brewer Mattocks, who came here in 1859 as a druggist but who did not practice medicine till some years later and Dr. Charles E. Smith, Sr. Drs. Flagg and Smith reside here, the former still in active practice while Dr. Mattocks lives in Pittsburg, Pa.

Dr. Wharton married Miss Susan Budd of Philadelphia who died in 1890.

MINNESOTA PUBLIC HEALTH ASSOCIATION COLUMN

By H. W. Hill, M. D.
Executive Secretary, M. P. H. A., Shubert Bldg., St. Paul, Minn.

Medicals "Making Friends" With the Public, Suggestion No. 1.

"Can't be done?" It has been done. Here are the facts. On January 15, 1920, all unknown to those concerned, there worked itself out a curiously simple beginning which has the germ of a revolution in it. The Goodhue County Medical Society set that date for its regular monthly meeting. A speaker on Public Health from the Twin Cities was secured. So far so good, and perfectly ordinary.

But the suggestion came then that the Goodhue County Public Health Association, a lay organization, the local branch of the Minnesota Public Health Association, should be invited to the Goodhue County Medical Society meeting to hear this speaker.

It was clearly understood that when the Public Health address was finished the laymen would depart, and the medicals would go on with their ordinary technical program.

These plans were carried out as arranged, up to the point where the popular address was finished. Plenty were present of laymen, laywomen, laychildren connected with the County Public Health Association —more than there were of medicals. But when it was announced by the president of the Medical Society that the popular part of the program was ended, and that those who did not care for the technical papers were at liberty to depart, scarcely a soul departed! Rather taken aback, the medicals hesitated, but at last plunged into their set technical program.

The public stayed and stayed and kept staying. The medicals braced up, began to talk in language "understanded of the people." They described their triumphs, and also confessed frankly their defeats and errors in human fashion, as though no laymen were in hearing distance. The meeting grew friendly, conversational. Medicals only spoke, but they spoke openly and clearly, baring their breasts to the assembled public. When all was finished, Goodhue county had had an experience unsurpassed in human interest.

Our counsel is that every county medical society try the same plan. Let us show the public that we are men like as they are—let us break down in real good earnest the isolation of the profession from the rest of the world. Combination meetings with the public, using the County Public Health Associations for a nucleus of an audience, will go very far towards better understandings, wider interests, more confidence.

Nor should such meetings be just for public health in its accepted sense. Public health may well furnish the "jump off," but the interest of the public in every phase of medicine is deep and wide and growing. Medicine is no longer a luxury but a real need. The public sees and feels it—they want to know about it. Let the medical profession itself do the teaching—and here is at least one way of doing it; a beginning of our program for developing the "Medicine of the Future."

OF GENERAL INTEREST

Dr. Christian Johnson of Willmar has moved to Everett, Wash.

Dr. L. E. Doolittle has been appointed school physician of Duluth.

Dr. C. L. Hess formerly of Rochester has moved to Bay City, Mich.

Dr. W. A. Bessesen of Albert Lea is planning to move to Minneapolis.

Dr. E. K. Pfaff of Minneapolis has moved to Hendricks to assist Dr. Jensen.

Dr. F. L. Bregel formerly of Fairfax is now serving with the Red Cross in Siberia.

Dr. W. Ray Shannon of Minneapolis conducted a baby clinic in April at Pine City.

Dr. George Stevenson is associated with his father, Dr. G. A. Stevenson, at Albert Lea.

Dr. J. H. Dorsey of Glencoe has returned from Maryland where he spent the winter.

Dr. and Mrs. Portman have returned to Jackson. They have spent the winter in the south.

The Central Interurban Clinical Club met in Minneapolis and Rochester, May 21 and 22.

Dr. Frank Gunn has located in Baudette. He was formerly city physician of Eau Claire, Wis.

Dr. B. S. Bohling of Duluth has gone to Chicago to do special work for the university hospital.

Dr. H. E. McKibben of Hector was married on April 10th to Miss Anna Edstrom of Omaha, Neb.

Dr. and Mrs. G. A. Eisengraeber returned to Granite Falls, having spent the winter in California.

Dr. Harold C. Stratte of Dawson has been appointed interne at the Bellevue Hospital in New York.

Dr. Myron O. Henry of Minneapolis was married April 14th to Miss Lucile Fisher of Minneapolis.

Dr. E. H. Morris of Pittsburgh, Pa., will locate in Austin and become associated with Dr. C. C. Leck.

Dr. G. T. Haugan of Battle Lake will move to Fergus Falls and become associated with Dr. T. N. Kittleson.

Dr. Russell A. Hennessy has returned from service and has again become associated with Dr. Granger of Rochester.

Dr. F. W. Davis of Alden is taking a post graduate course in Chicago. He will specialize in eye, ear, nose and throat work.

Dr. P. S. Epperson formerly of Biwabik, Minnesota, now taking post-graduate work in Chicago, will locate in Aberdeen, S. D.

Dr. Roy Andrews of Mankato has returned from New York and Boston, where he has been taking a post-graduate course in pediatrics.

Dr. L. F. Sutton, field inspector, Minnesota Sanitorium Commission, has gone to Europe to make a study of social conditions in England.

Dr. W. J. Marclay of Minneapolis was chosen one of the directors of the National Tuberculosis Association at the meeting of the association in St. Louis.

Drs. Baker and Burnap of Fergus Falls; have taken into their firm Dr. A. W. Lee, who since his return from France has been practicing in Underwood.

Dr. J. R. Elsey of Glenwood has been appointed medical examiner for the Bureau of War Risk Insurance for the fiscal year ending June 30, 1920.

Dr. J. L. Adams and wife, of Morgan, have gone to California. Dr. B. Flinn of Redwood Falls will look after Dr. Adams' practice while the latter is away.

A Diagnostic X-ray Laboratory has been established at 217 Lowry Bldg., St. Paul, by a number of St. Paul physicians. It is under the supervision of Dr. R. G. Allison.

President Jessup, of the University of Iowa; Dean Seashore, of the Graduate School; and Dean Dean, of the College of Medicine, visited the Mayo Foundation, Monday, May 17.

Dr. Robert Lovett of Boston, Mass., gave a Mayo Foundation Lecture Monday evening, May 3. The subject of the lecture was, "The operative treatment of infantile paralysis."

Dr. T. G. Clement of Amboy has been discharged from the service and will locate in Minneapolis as a specialist on diseases of the lungs. He has been appointed instructor at the University in his special line.

Several shipments of fake sure-cure medicines made in Canada have been refused admission to the country by the Federal Food and Drugs Act. These fakirs seem to die hard and are continuing their bunko game in Canada.

The names of Drs. Cyrus Northrop, Chas. H. Mayo and Wm. J. Mayo appear on the new Board of Electors to the Hall of Fame of New York University. This is a great honor as only most broadminded and representative Americans are chosen.

The New York Association for Medical Education, organized last August, has endorsed the $2,000,000 endowment fund campaign of the Post-graduate Medical School and Hospital. The campaign is well under way and promises to reach the goal set.

The Mankato Clinic announces that Dr. J. T. Schlesselman, limiting his practice to the diseases of the eye, ear, nose and throat and Dr. A. M. Snell, limiting his practice to internal medicine, have associated themselves with the Mankato Clinic.

The Chinese Red Cross Society was formed in 1904 during the Japo-Russian War. Following the war a Chinese Central Red Cross Hospital and Medical College for Chinese Students was established near Shanghai. Instruction is carried on in English and the equipment is up-to-date.

At the last regular meeting of the Stearns-Benton County Society held in April the following officers were elected: President, Dr. W. L. Beebe; vice president, Dr. H. W. Goehrs; secretary-treasurer, Dr. H. B. Clark; board of censors, Dr. J. H. Beaty, Dr. Geo. Sherwood and Dr. W. L. Beebe.

A large part of the article entitled "Prevention and Control of the Venereal Diseases" published in our April issue by Dr. Sherman Lull, was taken from the booklet entitled "Today's World Problem in Diseases Prevention," by John H. Stokes, M. D., of the Mayo Clinic, and quotation marks omitted. In justice to Dr. Stokes attention is called to this fact.

Dr. H. W. Hill, executive secretary of the Minnesota Public Health Association, has been appointed chairman of a special committee of eleven state representatives who will perfect plans for a reorganization of the National Tuberculosis Association. Dr. Hill was reelected chairman of the Sociological Section and chairman of the National Conference of Tuberculosis Secretaries.

In New York City the Board of Ambulance Service has reported a definite decrease in cases of alcoholism. Bellevue Hospital had 228 calls for alcoholic cases in January and February, 1919, and 31 in the same two months in 1920. As a result it is estimated this one hospital will have room for some 7,000 new patients this year. It is interesting to speculate on the total effect of prohibition throughout the country.

Licenses to practice in Minnesota were granted to eighty-eight physicians by the Minnesota State Board of Medical Examiners. Sixty-two of these were graduates of the last class of the University of Minnesota Medical College. The remainder were from other states and medical men of overseas experience. The following were elected on the examining board: President, Dr. A. M. Eastman, Minneapolis; vice president, Dr. Ida A. MacKean, Minneapolis; secretary-treasurer, Dr. Thomas McDavitt, St. Paul.

A staff was organized by the visiting physicians and surgeons of Fairview Hospital on April 28, 1920, at the hospital. The officers elected for the year are Dr. H. L. Williams, president; Dr. Oscar Owre, vice president; Dr. F. J. Souba, secretary-treasurer. Meetings of the staff will be held on the evening of the first Wednesday of each month at the hospital. A program, consisting of papers and clinical case reports, will be a part of each meeting. The first regular meeting was held on May 5, 1920, at the hospital.

Numerous opportunities for physicians are announced by the United States Civil Service Commission. Competitive examinations for bacteriologists and those desiring Panama Canal service are to be held in the near future. Vacancies in the positions of physicians in the Indian Service, acting assistant surgeon in the Public Health Service and in the Coast and Geodetic Survey will be filled from time to time. Those interested may obtain particulars from the Secretary of the United States Civil Service Board, Post Office, St. Paul.

According to the Survey for April 17, 1920, health clinics, under the supervision of the Minnesota Health Association, have been held in nearly all of the eighty-six counties of the State. It was Dr. Walter R. Ramsey of St. Paul, who first suggested the organization of the children specialists throughout the State to give their services to the counties for preventive work. These clinics now include

dental, eye, ear, tuberculosis and obstetrical clinics in addition to the children's clinics. The value of the work can scarcely be overestimated.

The State Board of Health is feeling the pinch which threatens to become a strangle hold of the High Cost of Living. The activities of the board are such that they tend to increase with the growth in population and industrial activities. The recent influenza epidemics have made additional clerical help necessary. With the increase demanded by salaried individuals now comes the necessity of cutting down in number of employes. This means a restriction in the activities of the board. This will be felt most keenly in the divisions of vital statistics and sanitation. Supervisions of pasteurization will temporarily have to be suspended. A consideration of the budgets for the ensuing year will be taken up at a special meeting of the board in June.

Figures of the war department show that twenty-eight American Red Cross nurses wear the Croix de Guerre of France, two the British Military Medal, fifteen the British Royal Red Cross, first class; and fifty-two the British Royal Red Cross, second class. Sixty-seven have been decorated with the Medaille de la Reconnaissance of France. One nurse wears the Medaille de la Reine, of Belgium, three the Silver Cross of St. Anne of Russia, while the Distinguished Service Cross of the United States, has been conferred upon three others and the Distinguished Service Medal upon two American Red Cross nurses. Sir Douglas Haig's list of mentions for gallant service on the Western Front includes the name of thirteen Yankee nurses; five others have received the British Certificate of Merit, while General Pershing has cited thirty-four for distinguished service and unusual bravery under shell fire.

A special meeting of the general staff of the Mayo Foundation and Clinic was held in honor of the members of the British and French Commission visiting and investigating medical and surgical institutions with a view to determine the possibilities of a more intimate relation between the countries and the establishment of international reciprocity. Dr. Wilson acted as chairman. Dr. Walter L. Biering and Dr. D. A. Strickler, both members of the National Board of Medical Examiners, gave in brief the purpose of the present visit to this country that the two commissions are making. In their remarks Sir Humphrey Rolleston referred to Rochester as the surgical mecca and Colonel Waring, the other member of the British Commission, mentioned that it had been determined to bestow on Dr. C. H. Mayo a fellowship in the Royal College of Surgeons, on July 6th of this year. Professor Roussey of the University of Paris and Professor Desmerest of Paris, and Dr. Norman Walker of Edinburgh, also spoke.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH.

FLOYD O. WOODWARD,
DONALDSON BLDG., MINNEAPOLIS.

THE RAPIDITY AND PERSISTENCE OF ACTION OF DIGITALIS ON HEARTS SHOWING AURICULAR FIBRILLATION: G. Canby Robinson. (Am. Jour. Med. Sc. Jan., 1920). In order to determine the time required to get the initial effect, the maximum effect and the duration of action of digitalis, twenty-six cases showing auricular fibrillation and auricular flutter were studied and frequent observations of the ventricular rate, radial pulse rate and pulse deficit were made.

The Eggleston method of administering a single large dose of a standardized tincture of digitalis was used. Most of the cases received a dose of fifteen cubic centimeters. Given in repeated small doses, digitalis requires many hours or even days to affect the heart.

In all of the cases observed, the ventricular rate became definitely slowed in two to five hours (initial effect). The disappearance of pulse deficit was taken as showing full digitalization. This effect was obtained at varying lengths of time, the minimum time being six hours and the maximum time twenty-six hours.

In order to determine the duration of digitalis effect from the single large dose, the patients were kept constantly in bed and careful records made of the ventricular and pulse rates. When the heart rate became accelerated and the pulse deficit increased, the drug was considered to have begun to be ineffectual. In this series the digitalis effect lasted from four to fifteen days, averaging nearly ten days.

The persistence of the action of digitalis is of considerable pratical importance. Hatcher has shown that various digitalins vary in their persistence. Cohn, Fraser and Jamison found the duration to vary from five to twenty-two days as determined by the change in the T-wave of the electrocardiogram. Eggleston found four to twelve days the duration and that digitonin and digitalis were rapidly absorbed from the alimentary canal of men. It has been shown experimentally that there is a definite difference in the absorption rates of different digitalis preparations. Haskell, et. al. believes the tincture is better absorbed than the infusion.

Nearly all the cases reported in this series showed very marked clinical improvement within a few

hours after the administration of the drug. It is this rapid and uniform rate of action of the single large dose that commends and justifies its use when the patient is under constant observation in the hospital. The author feels, however, that further studies are required before such large doses as were given to his cases should be recommended for general use.

FLOYD O. WOODWARD.

THE TREATMENT OF HYPERTENSION: Eli Moschcowitz (Am. Jour. Med. Sci., April, 1920.) In a previous paper on hypertension, Moschcowitz advanced his belief that hypertension and hypertensive states are commonly found in individuals of a certain type, having physical and psychical characteristics which typified them. He calls attention particularly to the fact that they are inclined to be overweight, with short necks and slow and unathletic movements, and psychically prematurely old, lacking the ability to play either mentally or physically. Even though we may be at variance with his belief, that hypertension is a primary pathological state due to unknown causes, and that arteriosclerosis and nephritis, particularly the latter, are merely secondary manifestations, yet his ideas concerning treatment are basically sound and worthy of review.

He discusses them under the four headings: Firstly, instructions to the patient; secondly, diet; thirdly, exercise and play; fourthly, drugs.

In his instructions to the patient, he minimizes the significance of high blood pressure as much as possible to the patient, and believes that oftentimes these patients would be better off if they had been told nothing. Extreme tact is necessary. The doctor should teach the patient tactfully the nature and significance of hypertension, and explain its significance. He deprecates the advice so commonly given that the patient retire from business, and believes that advice to be unsound. On the contrary, he advises patients to stick to their work, probably at times shortening the hours or devolving certain features of the business of a particularly strenuous nature to others. Frequent holidays are advised, and change from the daily routine strongly urged.

In discussing the influence of diet, he thinks that the low protein diet for hypertensive states is unfounded on any experimental or sound empiric evidence, as he has never seen a high protein diet influence the hypertension in any way. If overweight, he believes a reduction in diet advisable, and suggests simple food as fruits, coffee or tea (without sugar), meat, vegetables, salads, and a small amount of bread. When a minimal weight is reached which he thinks proper for the patient, he gradually increases the food to maintain the weight level at that particular point.

Under exercise he advises that rest, strictly speaking, be employed only in the treatment of hypertension when circulatory insufficiency prevails. Otherwise he believes that exercise, particularly in the form of play, is of striking value. Golf he considers the exercise par excellence.

By attaining the minimal weight level with diet and exercise, most of the symptoms are promptly ameliorated. The wind is better, the cardiac reserve increased, and subjective symptoms promptly disappear. He thinks the influence of these factors is more marked on the diastolic pressure than on the systolic, resulting in an increase in pulse pressure.

Rest is of importance in three conditions: In severe circulatory insufficiency, as manifested by decompensatory phenomena; also in the cases of essential hypertension with high pressures and a full bounding pulse and signs premonitory of cerebral hemorrhage. And lastly, in all long standing cases of hypertension with aggravation of all focal organic signs, as severe dyspnea, general enfeeblement, etc. In these cases rest seems to be of distinct value.

Medicinally, he places digitalis at the head of the list, and believes its use is not sufficiently widespread. Digitalis certainly does not increase the blood pressure, and by slowing the heart and enabling the organ to accumulate a greater reserve, it proves of great value. It is countra-indicated when the pulse is slow (between 60 and 70). It is generally understood, of course, how valuable a drug it is in the decompensating stage of any form of hypertension. The nitrites he uses only when he has the so-called "spasm" phenomena, such as anginoid attacks, transient aphasias, headaches, dizziness, etc., but they should be given oftener than three or four times a day, as is the custom. He considers the iodids of little or no use, and is skeptical as to the value of chloral hydrate, thinking that a milder sedative or hypnotic is of more value. Caffein and the theocin derivatives are negligible as far as their effect on the heart is concerned, but they improve the secondary associations of hypertension, and in that way lessen the embarrassment of heart action.

In discussing the possibility of cure, he emphasizes the value of beginning treatment in these cases early, when the pressures are still only nominally elevated. He believes that he has cured a number of cases of persistent hypertension by the use of these methods, not only symptomatically but even objectively, by bringing their pressures back to normal. This is true in the class of cases in which the systolic was not any higher than 170 mm. and the diastolic only a little over 100, and with very little increase in the pulse frequency.

G. J. HIRSCHBOECK.

THE OCCURRENCE OF HYPOCHLORHYDRIA IN GALL BLADDER DISEASE: R. C. Fravel (Am. Jour. Med. Sc., April, 1920) gives the results of gastric analysis in 61 cases of bile tract infection, 49

cases with stones, and 12 cases without stones. In some of the cases the primary operation was for other abdominal conditions and the disease of the gall bladder was found during the course of the operation. The gastric analyses were made by a competent pathologist. The Ewald test meal was used and the (indicators) were Topfer's reagent and phenol-phthalein. Forty-five cases showed a free HCl. reading of less than 20 (in 16 there was a total absence of free HCl.) Eleven cases showed readings within normal limits and only 5 showed hyperacidity. The total acid readings fell below 40 in 39 cases and only in 11 were the readings above 50. These findings do not agree with the generally accepted readings of hyperacidity in cases of gall bladder disease. However other writers such as Hollweg, V. Aldor, Olly, Hernando, Wohl, and Hamburger have found a tendency to subacidity in large percentages of gall bladder disease cases. The author discusses the question of the function of the gall bladder, quoting experimental work and clinical observations especially in regard to the effect of marked disease or absence of the gall bladder on gastric secretions. He believes that the amount of acid produced in the stomach may be taken as an index of the function of the gall bladder. Any function remaining must be preserved during operations if possible. His main purpose, however, is to call attention to the occurrence of low acid values in cases of gall bladder infection, and he proposes to follow another series of cases using the fractional method instead of single analysis.

REUBEN A. JOHNSON.

EARLY ROENTGENOLOGICAL DIAGNOSIS OF ULCERATIVE TUBERCULOUS COLITIS: Lawrason Brown (Am. Jour. Roent., December, 1919) believes that this condition is a much more common complication of pulmonary tuberculosis than is generally recognized, autopsy records on phthisis revealing intestinal lesions in 60 to 80 per cent; the region of the ileo-cecal valve being involved in 85 per cent.

Symptoms: Phthisis cases beginning to do badly without any change in pulmonary signs, slight anorexia, prolonged meteorism, slight abdominal discomfort or actual pain, regurgitation or vomiting of food, constipation or diarrhea, and slight irregular temperature.

Method of X-ray Examination: Patient is given no laxative the day before the examination, eats usual breakfast and reports for examination 6 hours after ingestion of the barium meal. Brown uses the following meal: Barium Sulph. oz. IV. Flour; cocoa; sugar aa one tablespoonful; sweet milk q. s. ad oz. XVI.

Normally after a barium meal the stomach is empty in 3 to 6 hours. Barium first reaches the ileo-cecal valve in 1 to 3 hours and the ileum is empty in 5 to 9 hours. Barium enters the cecum in 2 to 4 hours. Six hours after the ingestion the head of the column is near the splenic flexure (at this time the cecum and ascending colon are well filled and the haustral markings are distinct).

The ascending colon remains filled for from 4 to 14 hours following the ingestion of the meal and in many cases as long as 36 hours. Complete evacuation of the colon takes place usually in 30 to 48 hours.

Pathologic Hypermotility: In cases later proved to have tuberculous ulcerative colitis, the barium is completely eliminated from the bowel in 24 hours. Closer examination shows that the cecum, ascending colon and other portions of the colon refused to retain the barium to their full capacity, but tended to discharge it rapidly. When the barium was held, the shadows were irregular and ragged in outline, and (watched under the screen) as soon as the barium was seen to approach this area, it was largely or completely passed on.

Another type: Instead of the cecum being filled, no barium had passed the ileo-cecal valve even though the stomach was empty (i.. e., increased tone of the cecum prevented the ileum from emptying) all the meal being seen in the terminal ileum. A later examination might reveal the head of the column in the middle of the transverse colon, and at the end of 24 hours the bowel be entirely empty, or the entire meal be in the sigmoid and rectum.

Filling defects—common in ulcerative tuberculous colitis—bowel has a ragged outline. Hypermotility due to other causes (i. e., castor oil)—this shows an increased motility in the colon—but no ragged outline; furthermore, the tendency of the ascending colon is to retain the barium a reasonable length of time.

Habitual diarrhea,— no definite filling defects simply a rapid emptying of the bowel, it sometimes being completely empty in less than 24 hours.

Further study with the barium enema: the material enters the colon in an unbroken column until it reaches the diseased portion where it may be held up temporarily, when increase in gravity or slight manipulation will overcome the resistance. The enema fills the diseased portion slowly and very irregularly. It seems as though the bowel were in a state of spasm and the enema found difficulty in gaining entrance. However, it would eventually fill, only to be forced out a few seconds later by spasm of this portion of the colon. In all cases showing the above manifestations which came to operation or autopsy cecal ulceration (tuberculous) was found.

Diagnostic fluoroscopic findings were (1) hyermotility, (2) cecal filling defects.

Discussion of the paper brought out the fact that irritability of the colon must be constant and emptying of the diseased portion constant before tuberculous ulceration can be diagnosed.

C. N. HENSEL.

SURGERY

SUPERVISORS:
WALLACE H. COLE,
LOWRY BLDG., ST. PAUL.
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER.

AN EXPERIMENTAL STUDY OF URETERAL LIGATION; DEMONSTRATION OF LATE RESULTS TO URETER AND KIDNEY: John R. Caulk, and R. F. Fischer, (Surg., Gyn. and Ob., April, 1920.) This study was made after observation upon a patient in whom both ureters were ligated during a hysterectomy, for fibroids. There was no urine for eight days when double nephrostomy was done. On the fifty-eighth day the patient voided and ten days later the urine was all passed by the bladder and the nephrostomy wounds healed. The patient is in excellent health and the renal function has returned to normal.

The authors confine themselves strictly to ligations of the ureter and not to severence. The experiments were done entirely on dogs. The authors endeavored to determine (1) the time necessary for the absorption of No. 2 plain catgut, (2) if the ureter after ligation would finally open, (3) the manner in which this opening occurred, (4) the length of time for it to open, and (5) the renal complication at various intervals following sudden occlusion of the ureter.

The experiments showed that No. 2 plain catgut was never absorbed before the end of three weeks, consequently in cases of double ligation before death of the patient or in single ligation destruction of the kidney, deligation, ureterovesical anastomosis or nephostomy must be adopted. Deligation is difficult and ureterovesical anastomoses are not entirely satisfactory. After ligation of a ureter the first indication of a lumen through the site of ligation occurred at the fifth week which had opened up sufficiently by the sixth week to allow fluids to be injected through. At the end of eight weeks the ureteral lumen is fairly well open being somewhat restricted at the site of ligation which is more apparent than real. At twelve weeks there is less constriction. The authors' studies lead them to believe that strictures of the ureter are not as frequent as is usually supposed, but that the majority of them are spasms in the neighborhood of inflammatory processes.

Dilatation of the ureter and kidney pelvis starts fairly promptly after ligation. To conserve the kidney the obstruction must be removed within two weeks.

The blood nitrogen showed a rise in some animals with single ligation. Drainage was done usually on the fourth day with drop to normal of blood nitrogen in form two to four days.

The authors conclude that catgut will not be absorbed rapidly enough to protect a kidney against complete destruction. A ureter ligated with catgut will open sufficiently in from six to eight weeks to allow complete drainage. V. C. HUNT.

GASTRO-ENTEROSTOMY STILL THE TREATMENT FOR CHRONIC GASTRIC AND DUODENAL ULCER: R. C. Coffee, (Ann. Surg., 1920, Vol. 71, p. 303.) The author discusses the following points in his paper: 1. Immediate danger from the operation. 2. Subsequent dangers associated with the results of the operation. 3. Amount of final relief of morbidity. 4. Life expectancy after operation.

The paper is based on 233 patients with gastro-duodenal ulcer operated on by him from April, 1904 to October, 1919. There were ten deaths, a mortality of 4.33 per cent. Two patients died from hemorrhage, one of shock, one of pneumonia, one of empyema, one of dilatation of the stomach, two of anuria, probably uremia, and two of angulation of the intestine, probably obstruction.

Secondary or recurring, either at the point of excision or a new place, ulcers occurred in nine cases (3.8 per cent) of the entire series. Two of these followed simple gastro-enterostomy. In eight sleeve resections there was a recurrence of the ulcer in two. In eleven cases of excision of the ulcer by knife or Balfour cautery, without gastro-enterostomy, a recurrence occurred in three. In twenty-two von Eiselsberg exclusion operations secondary ulcers developed in two while in 165 simple gastro-enterostomies ulcers have been known to develop only in two.

Severe hemorrhage at a remote period following operation occurred in three cases, only one in 165 simple gastro-enterostomies, and two in twenty-two von Eiselsberg operations. Of the 233 patients operated on for ulcer of the stomach or duodenum, four have been known to have developed cancer; one of these was in the group of 165 cases of simple gastro-enterostomy.

The simple gastro-enterostomies in this series shows a mortality of four in 165 cases (2.42 per cent) all other operations combined, sixty-seven cases, shows an immediate mortality of 9 per cent. All the evidence indicates that simple gastro-enterostomy gives better results from the standpoint of recovery than any radical operations.

The author recommends a gastro-enterostomy and awaiting results; with a radical excision later if trouble develops. V. C. HUNT.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:
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FIDELITY BLDG., DULUTH.
ALBERT G. SCHULZE,
LOWRY BLDG., ST. PAUL.

THE LETTSOMIAN LECTURE ON TUMORS COMPLICATING PREGNANCY, LABOR AND THE PUERPERIUM: Herbert R. Spencer, (Brit. Med. Jour., Feb. 7, 1920.) The lecture is based on 37 cases.

Eight illustrate the fact that in cases of small tumors, and even in case of some as large as an adult's head, no difficulty will be encountered during pregnancy and labor. One case illustrated the proneness of pedunculated reniform tumors to rotate, and cause inflammation. Several cases show instances of retroversion, retroflexion, acute anteflexion and inversion of the uterus caused by tumors. Several sub-mucous tumors were removed through the cervix after delivery or miscarriage; hysterectomy was not necessary.

Three fatal cases were in the series, one from injury to the bowel caused by two fibroids; one from a twisted and infected reniform tumor and the third from sepsis following cesarean section in case of infection.

Fibroids occur about once in 150 pregnancies.

It has been suggested that fibroids might be congenital but examination of the uteri of 100 stillborn females failed to reveal any tumors. They are practically unknown before puberty, and rare before 25 years and Bayle in 1813 stated "that they were present in nearly every woman over 40 who had preserved the physical signs of virginity". There is reason to believe that sterility favors their growth and that child bearing and suckling, to an extent, prevent their occurrence.

During pregnancy fibroids often increase in size due to edema, hyperplasia and hypertrophy; sometimes they remain stationary, sometimes they reduce in size. They may become softer, may change their shape, may become more prominent, and they may become fixed in the pelvis by impaction or inflammation due to infection or degeneration. A degenerated fibroid may be sterile. The author found an abscess of pure streptococci in the center of a fibroid in a virgin whose only symptom was a cachexia. He suggests that infection might be hematogenous in origin. The vagina may be the route of infection of sub-mucous fibroids.

After labor some tumors may entirely disappear.

Ectopic pregnancy is seldom met with as a complication of fibroids, but post-partum hemorrhage occurs with unusual frequency, although the latter condition may be mistaken for hemorrahge due to submucous fibroids or the insertion of the placenta on a tumor. The sub-mucous form only is apt to cause abortion.

Pain and tenderness may develop over a tumor but the author has never encountered a case of "unbearable pain" which some observers claim justifies hysterectomy in early pregnancy. Torsion and infection produce acute symptoms and call for immediate surgical intervention.

Signs of pressure, such as edema, may arise; malpresentations are frequent; labor may be surprisingly easy, as tumors originally found at the brim are often drawn high up; forceps may be needed for inertia; retained placenta may occur and post-partum hemorrhage may be severe.

The diagnosis of pregnancy and of fibroids is not easy and the difficulty is increased if both conditions exist. In case of pregnancy during the earlier months the diagnosis is made by suppression of menses, a uterus larger than should be, together with hard irregularities. Later in pregnancy the certain signs are available. The tumor remains hard, the uterus soft and contractile; fibroids do not change position as fetal parts do and they become more marked during a uterine contraction while fetal parts are lost. Tumors show a slight mobility with a tendency to return to their former place. In case of twisted fibroid, the hardness of the tumor and the age of the patient must be kept in mind and examination under anesthesia may be necessary.

After delivery, owing to laxity of the abdominal wall, sub-peritoneal and intramural fibroids are more easily diagnosed. A submucous fibroid should be suspected in case of retained placenta, post-partum hemorrhage, a uterus remaining large and hard, and a fever which may be due to retention of the products of conception or infection of the tumor. A differential diagnosis must be made between a tumor and retroflexion; a cystic tumor and an ovarian cyst; a tumor and an inverted uterus.

Prognosis is good in a great majority of the cases if handled with judgment and due attention paid to a sepsis.

Most cases require only careful prenatal supervision, with rest, aperients and anodynes if the growth becomes painful. Induction of abortion and premature labor, and forceful forceps delivery past obstructing tumors are contraindicated, although forceps may be used to overcome an inertia. Craniotomy may be done if the fetus is dead and the mother not infected.

Vaginal myomectomy may be done in case of a cervical tumor. Abdominal myomectomy is rarely called for except in case of large, twisted or necrobiotic tumors. The operation often leads to abortion and often calls for a hysterectomy to control the hemorrhage from the bed of the tumor. Before myomectomy and cesarean section if the tumor proves to be infected, a hysterectomy should be done.

Hysterectomy in early pregnancy, except in case of hemorrhage and infection, is rarely called for. "The practice of hysterectomy in the early months of pregnancy is, in my opinion, much too common, both abroad and in this country. I have never found it necessary."

Every endeavor should be made to allow pregnancy to continue to the time of viability. Conservative cesarean section is rarely indicated for fibroids only, but may be done when that condition is associated with mal-presentation and contracted pelvis.

The author then presents three tables; one of five cases of abdominal myomectomy, one of six cases of conservative cesarean section and one of

five cases of cesarean section followed by abdominal hysterectomy.

ALBERT G. SCHULZE.

TREATMENT OF THE SEVERE VOMITING OF EARLY PREGNANCY: Frank W. Lynch (J. A. M. A., Vol. 73, No. 7.) It is assumed that the mother is in some way sensitized to vomiting since this occurs so often in cases where no ordinary cause is present. Pathology shows changes in the liver, cloudy swelling or characteristic lesions in the lobule, which are present in all fatal cases. The distinction between the "Reflex-neurotic" and "Toxic" types is not absolute, but fatal cases of either form show more or less definite change in the liver lobule. The relationship of the Nitrogen Metabolism and Ammonia Coefficient in these cases is substantiated by Lynch's observations with certain reservations. It is best to state actual amounts of the ammonia nitrogen content of the urine rather than per cent. Recognize that this is influenced by diet, medication, and body weight. An acidosis as determined by the CO_2 tension is common in normal pregnancy and is not increased in case of severe vomiting. Ammonia nitrogen may be somewhat increased in mild cases of vomiting, but all patients whose condition was critical, judged clinically, showed a high ammonia content. This may also be seen in cases of starvation but never approaching the degree shown in toxic vomiting. Conclusive evidence is shown in vomiting cases under Lynch's observation with a high ammonia content, which returned to normal under treatment, with preservation of the pregnancy.

Treatment of toxic vomiting presupposes an exclusion of any local cause. It requires rest, proper hygiene, few drugs, relief of constipation by diet and high colonic flushings. Minute attention to diet, withholding food by mouth till there is no vomiting for 24 hours. Sodium bromide in large doses and glucose and sodium bicarbonate by rectum. Then small amounts of solid food: meats, twice toasted bread, butter, and cream, no fluids especially with meals. Bromides are gradually reduced, and are replaced by magnesia and soda by mouth. Gastric lavage is seldom helpful. Fulminating or progressive cases or those with black vomit, or with persistent high ammonia content should be aborted. He has had no results with normal pregnant serum, epinepherin, or corpus luteum. Uterus should be emptied by simplest method, since this may cause death. Chloroform is contra-indicated, ether is also objectionable. He prefers local anasthesia supplemented by nitrous oxide to twilight stage. If dilatation with Hegar's dilators is not sufficient, vaginal hysterotomy is best. Bags or packing are likely to increase symptoms and are more liable to be followed by infection.

ARCHIBALD L McDONALD.

PEDIATRICS

SUPERVISORS:
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STUDIES WITH A NEW METHOD FOR DETERMINING THE COAGULATION TIME OF THE BLOOD IN THE NEW-BORN: F. C. Rodda (Am. Jour. Dis. of Child., April, 1920.) The apparatus required consists of a spring lance, two, one and one-half inch watch glasses and a No. 6 lead shot, all of which are easily obtained. Glass and shot should be cleansed, soap and water followed with alcohol and ether. The heel of the infant is sponged with ether and a puncture is made sufficient to produce a free flow of blood without the slightest pressure. The watch glass containing the No. 6 shot receives the second drop of blood. A second watch glass is inverted over the first. They are gently tilted every thirty seconds until the shot no longer rolls but is fixed in the clot. The end-result is sharply defined, the shot is firmly embedded, so the glass may be inverted without dislodgment of the shot. The method is simple and easily applied. The average coagulation time in the new-born with the method is seven minutes, with a normal range of from five to nine or even ten minutes. The average bleeding time in the new-born with Duke's method is three and one-half minutes with a normal range of from two to five minutes. In the normal new-born there is found a tendency to prolongation of these times in the first days of life. Hemorrhage is accompanied, in many cases at least, with an exaggeration of this tendency or markedly prolonged coagulation and bleeding times. The coagulation and bleeding times should be studied in conjunction.

Routine determinations in the new-born will allow the selection of at least certain of the hemorrhagic conditions before the onset of symptoms and give the indications for the administration of blood. The method will allow of a check on therapy in hemorrhages of the new-born.

ROY N. ANDREWS.

APPEARANCE OF ISOAGGLUTININS IN INFANTS AND CHILDREN: W. M. Happ (Jour. Exp. Med., Vol. 31, p. 313) tested the serum and washed corpuscles of 131 infants and children against the serum and corpuscles of all four human blood groups. His work extended over a period of five years and he was able to retest the blood of various children as they grew older.

He found that isoagglutination is rarely present during the first month, but that in most infants the blood group was definitely established at the end of one year and that it was completely established in all cases by the end of the second year. The corpuscles acquire agglutinophilic receptors before

the serum acquires agglutinin. Usually from birth on the cells are agglutinable although the infant's serum may not possess agglutinin until later. Once the group is established it appears to be permanent.

Isoagglutinins are present in the mother's milk; but apparently are not transmitted to the infant, whose blood is often in a group antagonistic to his mother's. Hence Happ concludes that it is not safe to transfuse an infant from its mother without making preliminary tests. ROOD TAYLOR.

THE PROBLEM OF THE PREMATURE INFANT: John F. Sinclair (Arch. Ped., March, 1920), gives clear, minute directions for proper premature care. The secret of success he points out in the opening paragraph, "The premature infant presents certain problems which must be met promptly and with minute attention to detail. Indeed, success in treatment depends largely on the care and treatment which the infant receives from the moment of its birth and the scrupulous and exact carrying out of every detail".

Discussion falls under 3 heads.

(1) Maintenance of body heat which involves protection from chilling immediately after delivery, proper clothing and a suitable container or basket. The basket prepared as directed (is superior to any nickelplated incubator) may be readily provided in the average home. The basket temperature and the humidity are closely controlled by thermometer and hygrometer. Though a basket temperature of 80° is often optimum some infants will require more heat, others less.

(2) Isolation of the infant is extremely important since the premature is especially susceptible to respiratory infections.

(3) Feeding is very important; breast milk should be insisted upon, but formulae for artificial feeding are given. The quantity given by Breck feeder or gavage is proportionately much more than required by the full term new-born. The interval between feedings he feels should be elastic.

He points out the tendency of the premature to deficiencies of certain mineral salts, as iron, phosphorus and calcium, and recommends the early administration of these drugs as prophylaxis for rickets and anemia. FREDERICK C. RODDA.

ROENTGENOLOGY

SUPERVISORS:
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ROLE OF THE X-RAY IN DIAGNOSIS OF LONG-STANDING RENAL TUBERCULOSIS: J. Colston and C. Waters, (Johns-Hopkins Hosp. Bul., September, 1919.) That systoscopy and ureteral catheterization will show most renal tuberculosis is granted by Colston and Waters, but there are two classes of cases where the X-ray is invaluable: First, where catheterization is impossible on account of changes in the bladder mucosa. Second, in cases with chronic tuberculosis of the kidney with sluggish ulceration and absence of tubercle baccili in the urine.

The shadows vary from a small indefinite shadow case by a calcified tuberculous area about a calyx, to the lobulated shadow of a kidney consisting entirely of calcified abscess cavities.

Where the involvement is extreme the condition is not difficult to recognize but when early the area must be carefully differentiated from renal calculus, calcified glands, and gall-stones.

R. G. ALLISON.

FLUOROSCOPIC EXAMINATION IN INJURIES OF THE HEAD: M. William Clift (Am. Jour. Ront., March, 1920), believes that fluoroscopy of the head, while it cannot replace stereorontgenography in the study of certain head conditions, can be made to yield much information in connection with the presence of intracranial foreign bodies, the accessory sinuses and jaw, as well as in foreign bodies in the orbit, as a preliminary to localization. The use of a small radiator-type Coolidge tube is advocated; the tube working on a five-inch gap with a current of from three to five ma.

By adopting a routine method the skull may be gone over quickly and without prolonging the radiation beyond the limits of safety. CRANIUM—The patient is placed in the dorsal position, face upward. The observer grasps the head with his right hand and rotates it slowly to the right 90°, using a small diaphragm. When the head reaches the lateral position, the diaphragm is opened for a general survey of the cranium as a whole. The head is now brought back through an arc of 180° to the opposite lateral aspect and back to its original position. ACCESSORY SINUSES—The frontal sinuses and anterior ethmoids are now examined in the antero-posterior position. With his right hand beneath the occiput the operator raises the head until the great wings of the sphenoid no longer obstruct the view of the antrum. Fluid or foreign bodies, according to the author, are easily determined. EYE—In searching for foreign bodies in the orbit, the head is turned so as to bring the injured eye nearest the screen. The patient is directed to look up and down, the foreign body shadow moving with the eyeball. FOREIGN BODIES—The surgeon wants to know if (1) the skull has been penetrated, and the extent and nature of the fracture; (2) if the dura has been penetrated; (3) if a foreign body is present, its size, its location in reference to the wound tract, and its depth. Inasmuch as the path of a foreign body in the brain is fairly straight, if the head is rotated until the vertical ray passes through both the wound and the foreign body, the

observer is looking down the tract. The author prefers the Roussell method for determining the depth of a foreign body; and to locate a foreign body in relation to important cerebral structures has adopted the use of a cross-section anatomy with a celluloid key-plate showing a lateral view of the skull with the anatomical sections indicated. This he uses directly on the screen, and, having determined the depth of the foreign body, its exact location is quickly found by consulting the appropriate anatomical section.

In discussing operative guides, the author refers to the intermittent control method of Ledoux-Lebard, and states that its greatest value lies in those cases in which the surgeon has had difficulty in extracting the foreign body or in which its position is near some important structure. He explains that the Hirtz compas is not a localizing instrument, but strictly a surgical guide, and that as modified by Hirtz and Gallot it is so simple that it can be used in the most advanced hospitals. In cerebral foreign bodies the electromagnet of Beclere is mentioned; applied in the usual way, the obturator is then passed through the trephine opening and plunged into the brain to the foreign body. The magnet is then attached to the obturator, which, slowly withdrawn, brings with it the projectile. It is only applicable, however, when the foreign body is magnetizable.

A. U. Desjardins.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

Surgical Shock. Crile and Lower. W. B. Saunders Co., 1920. $5.00.

Pasteur. Dudoux. W. B. Saunders Co., 1920. $5.00.

Diseases of Women. Green. W. M. Leonard, 1920. $6.00.

Diseases of Rectum. Hirschman. C. V. Mosby Co. 1920. $5.00.

Sex Attraction. Vaughan. C. V. Mosby Co., 1920. $ .50.

Personal Beauty and Racial Betterment. Dunlap. C. V. Mosby Co., 1920. $1.00.

Standard Nomenclature of Diseases and Pathological Conditions, Injuries and Poisonings, 1919. Department of Commerce, Washington, D. C.

Arteriosclerosis and Hypertension. Warfield. 1920. C. V. Mosby Co. $4.00.

Diseases of Chest. Norris and Landis. W. B. Saunders Co., 1920. $8.00.

SYSTEMATIC DEVELOPMENT OF X-RAY PLATES AND FILMS. L. Wendell, B. S., D. D. S. C. V. Mosby Co., 1919. $2.00.

This is a very instructive little volume on the development of x-ray plates and films and the making of lantern slides.

The various methods of development are discussed and compared. Special emphasis is placed on the advantages of a strictly time development, even though this result in a plate much too thin or too dense, as only in this way can all the detail be brought out. The proper general density is then obtained by intensification or reduction if improper exposure should make this necessary.

With its reproductions of radiographs showing the effects of correct and incorrect development, as well as the descriptions and pictures of equipment, this book should be of considerable help to those responsible for this part of the work.

Edward Schons.

AFTER TREATMENT OF SURGICAL PATIENTS. Bartlett. Vol. I and II. C. V. Mosby. $10.00.

In these two volumes, Bartlett and collaborators have summed up post-operative treatment in its minutest details. This exhaustive work covers both immediate pre-operative and post-operative care. Many small details, that promote the patients' comfort, such as a post-operative recovery room, the minor details of transporting the anesthetized patient, etc., are presented in a very clear and concise manner with an abundance of illustrations.

Volume II covers the treatment of sequelae of the so-called major cases.

As a whole, this work presents innumerable important details which the busy surgeon tends to overlook. These two volumes deserve due consideration of any surgeon.

C. K. Williams.

AMERICAN ILLUSTRATED MEDICAL DICTIONARY. By W. A. Newman Dorland, A. M., M. D., F. A. C. S. Tenth edition.

This book needs no introduction to the medical profession. It is not intended to make the work an encyclopedia but rather a concise and convenient word-book with such collateral information as might be sought by the busy medical man. The book is amply illustrated and gives in tabulated form such prepared tables as Stains and Staining Methods, Methods of Treatment, Tests, etc. The work is in every way commendable.

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ORIGINAL ARTICLES

THE TREATMENT OF THE SECOND STAGE OF LABOR WITH SPECIAL REFERENCE TO THE PREVENTION OF INJURY TO THE CHILD AND TO THE PELVIC FLOOR*

By JOSEPH B. DELEE, M. D.
Chicago, Ill.

The second stage of labor begins when the cervix is completely dilated, and ends with the finished delivery of the child. It is often called the period of expulsion, but it is also a period of preparation of the soft parts,—vagina, pelvic floor and perineum, the preparation and expulsion occurring together. This stage lasts on the average from two to three hours in primiparae, and from ten to thirty minutes in multiparae.

This paper will be limited to the discussion of the phenomena of cases of primiparae or multiparae whose pelvic floor, by virtue of repair, offers the same resistance to the presenting part, and will treat only that portion of the delivery called the second stage, the time of expulsion.

In this restricted part of labor, lasting but two hours, many children's lives are lost, not a few women die, and many children, as well as mothers, are irreparably damaged.

Labor has been called, and still is believed by many to be, a normal function. It always strikes physicians as well as laymen as bizarre, to call labor an abnormal function, a disease, and yet it is a decidedly pathologic process. Everything, of course, depends on what we define as normal. If a woman falls on the handle of a pitchfork and ruptures her perineum, we call that pathologic,—abnormal; but if a large baby is driven through the pelvic floor, we say that it is natural, and therefore normal. If a baby were to have its head caught in a door very lightly, but enough to cause a cerebral hemorrhage, we would say that is decidedly pathologic, but when a baby's head is crushed against a tight pelvic floor, and a hemorrhage in the brain kills it, we call this normal, at least we say that the function is natural, not pathogenic.

In both cases the causes of the damage, the fall on the pitchfork and the crushing of the door,—are pathogenic,—that is disease producing, and in the same sense labor is pathogenic,—disease producing, and anything pathogenic is pathologic or abnormal.

Now you will say that the function of labor *is* normal; that only those cases which result in disease may be called abnormal. Granted, but how many labor cases, measured by modern standards, may be so classified? Sir J. Simpson said that labor, in the intention of nature, should be normal, but that in a large proportion of cases it was not so. If the proportion was large in Simpson's days, the middle of the last century, it amounts to a majority today. In fact, only a small minority of women escape damage during labor, while 4 per cent of the babies are killed and a large indeterminable number are more or less injured by the direct action of this natural process itself. So frequent are these bad effects that I have often wondered if nature did not deliberately intend that women should be used up in the process of reproduction, in a manner analogous to that of the salmon, which dies after spawning. Perhaps lacerations, prolapse, and all the evils soon to be mentioned are, in fact, natural to labor and therefore normal, in the same way as the death of the mother salmon and the death of the male bee in copulation are natural and normal. If you

*Presented before the Southern Minnesota Medical Association, Dec. 1919, Mankato.

adopt this view, I have no ground to stand on; but, if you believe that a woman after delivery should be as healthy, as well as anatomically perfect as she was before, and that the child should be undamaged, then you will have to agree with me that labor is pathogenic, because experience has proven such ideal results are excessively rare.

There is not time here to go further into this part of the subject, so suffice it to say, that beside Sir J. Simpson, others have expressed the opinion that labor is no longer a normal function,—Engelman, the medical historian, J. O. Polak of Brooklyn, Schwartz of St. Louis, F. S. Newell of Boston (qualified), Moran of Washington, Kronig of Freiburg, et al.

What are the factors that render labor so pathogenic? Dangers, immediate and remote, threaten both mother and child throughout, but we will discuss only those of the second period.

First, for the mother. Infection is always a threat, even under the most ideal conditions. Virulent streptococci inhabit a large per cent of vaginae, and if the second stage becomes too prolonged, if the bruising of the parts is too extensive, if the woman's resistance is worn down by too much suffering or by hemorrhage, they may invade the organism and prove fatal. Death may occur in a fashion that hides the cause from the unobservant accoucheur, e.g. a very mild sepsis, or even a single rise in temperature and, in the second week, death occurs from embolism.

Exhaustion is not infrequent in a second stage that may not be too long for a healthy woman, but in one whose nerve reserve is low, exhaustion may lead to immediate nervous shock, and later, pronounced neurasthenia. If the Twilight Sleep propaganda has taught us anything, it showed us the actual value of preserving the nervous strength of the parturient.

That rupture of the uterus may occur in the second stage needs no extended mention, but it is rare and getting rarer every year.

Of greatest importance, because of greatest frequency, is the damage to the pelvic floor and perineum. Embryologically and anatomically, the outlet tissues of the pelvis are to be divided into two parts, the pelvic diaphragm or pelvic floor, made up of the levator ani muscle with its superior and inferior fascia, and the urogenital septum and perineum. The perineum and urogenital septum lie below the pelvic floor, and do not form part of it, though attached by fascia, and an incision in their continuity will not save the true pelvic floor or diaphragma pelvis from injury. This point is of importance in discussing episiotomy.

Multitudinous volumes have been written on the anatomy of the pelvic floor, thousands of dissections have been made, and yet there is no unanimity of thought on the subject. No one nomenclature is generally accepted; the disposition of the various parts of the muscle and the various layers of fascia, is not positively known; how the pelvic floor acts during the dilatation of the parts in labor is not fully understood; indeed, it might be said, that we know less about the anatomy of the pelvic floor than of any other part of the body. This is the reason of the numerous operations that have been devised for repair of obstetric damage, and their number is legion, and also for the unsuccess of the majority of them. For the last 25 years I have made a special study of the pelvic floor both obstetrically and gynecologically, and I made four dissections of the levator ani, one of them together with Tandler of Vienna, who is Professor of Anatomy at the University, and who wrote a large book on the subject. I also studied his numerous anatomic preparations. One method of investigation that is of enormous value, in fact, hardly less useful than an anatomic dissection, is the minute palpation of the muscle in the living subject, and its study at operation. This source of information has been neglected by most writers, though it is surprisingly easy. I put a rubber catheter into the rectum, which locates this organ, and with the finger in the vagina, palpate out the various structures. The woman is asked to contract and relax the muscles, and they are identified by their actions. During labor, the location and the changes in the levator ani are studied by means of rectal examinations which may be repeated as often as is needed. From all these sources I have gotten quite concise notions of the levator ani and the urogenital septum, some of which I have tried to illustrate in these plastic models, which I show here. Remember that these crude

models are only diagrammatic, but I will vouch for the truth of the lessons they teach.

Model No. 1 shows the normal virginal pelvic floor.

Model No. 2 shows the pelvic outlet under the distension of the passage of the head. You will notice in addition to radial dilatation, there is also a downward, axial, displacement of all the organs. This downward dislocation of the anus, the sphincter ani, the rectum, and the vagina, is of supreme importance in the operation of the repair. We must anchor all these organs higher up in the pelvis, we must unite them to the parts from which they have been torn, which is not an easy matter. Much discussion has arisen as to whether the muscle or the fascia is the more important in the support of the pelvic viscerae. There should be no discussion,—both are important, but the fascia has a special function of localizing the structures. The fascia that binds the rectum to the levator ani, and spans the hiatus between the levator ani pillars, suffers the most during the overdistension caused by the passage of the head. When this fascia is not properly restored, it allows the levator ani to gape widely a veritable diastasis of the levator pillars similar to diastasis recti abdominis and permits the rectum to roll downward. This causes the increased pelvic floor projection of multiparae, and is shown in model No. 3.

Another form of damage to the levator ani, is a separation of its fibres behind the rectum at the raphe with the muscle of the other side, —the raphe which is attached to the coccyx. When the muscle is torn here, the levator ani halves separate and hang down as two thick pillars on either side of the gaping introitus. Then the anus and rectum sag into the hiatus toward the coccyx. For the proper repair of such a laceration, and also for the repair of the fascia which holds the levator ani pillars together, one would have to unite the two separated halves of the muscles behind the rectum, making an incision behind the anus, between it and the coccyx,—(similar to the Kraske), exposing the muscle through the ischio-rectal fossae, I have performed this operation twice on the cadaver and it truly restores the integrity of the pelvic floor, but it is too bloody and radical for routine practice. We can get sufficient functional results with a less serious dissection. The accepted method today is to bare the two levator pillars after incising the perineum and uniting the fascia and the muscle in front of the rectum. Now these muscles were never there in nature, but it makes a strong pelvic floor if properly done. Model No. 4 shows this operation.

Still another form of injury to the levator ani is its abruption from its attachments to the pubis. This form of injury is one of the worst because it is almost impossible to reunite the torn ends to the bone. In one case I elevated the periosteum, to free it so that the muscle could be sewn up in place.

Finally there is the overstretching of the muscles and the fasciae. Some injury to the diaphragma pelvis occurs in the vast majority of labors and the results are felt throughout life. The urogenital septum is invariably torn in full term labor. I have seen a hymen intact after coitus, but I have never seen a urogenital septum intact after full term labor. Since this laceration is constant, it is therefore natural, and therefore should be called normal, but since it leads to many pathologic sequellae, I would call it pathogenic and therefore pathologic. The urogenital septum is composed of the rudimentary perineal muscles and of fascia and it closes the hiatus urogenitalis. If it is torn the the vulva gapes, the vagina is exposed to infection and dirt of all kinds, especially the entrance of feces. These set up vaginal and cervical catarrhs, which may be the beginning of local infections, at least they often cause pelvic discomfort, backache, invalidism and leucorrhea.

The fascia between the bladder and vagina (the utero-vesico-pubic ligaments) is continous with the urogenital septum. It is almost always more or less injured in full term labor, and this injury is very serious. The bladder sags, the urine may not be all emptied and we all know the ultimate effects of residual urine, —cystitis, ureteritis, pyelitis, even pronounced Bright's disease.

When the lacerations of the subvesical fascia and the urogenital septum are combined with laceration of the diaphragma pelvis (the levator ani) the late results are still more pronounced and pathologic. The cystocele be-

comes more marked, rectocele occurs, (with constipation, etc.) the uterus sags and begins to prolapse. The ureters are drawn down with the uterus and become kinked, causing partial hydronephrosis which invites kidney infections.

The congested uterus, exposed to infection, gets large and hard, the so-called myopathia uteri or chronic metritis. Without doubt it causes general, as well as local, symptoms which are only relieved by its removal or by radium.

Among the late effects of pelvic floor lacerations must be mentioned neurasthenia and invalidism.

The dangers of the second stage of labor to the child are much greater than one who has not studied the matter would think. It will surprise some who are present to know that the following injuries have been caused by the forces of natural, spontaneous labor;—fracture of the skull; rupture of the tentorium cerebelli; intracranial hemorrhage (numerous minute and large ones); retinal hemorrhage, abruptio retinae, dislocation of the lens; facial paralysis; Erb's paralysis; ruptnre of the sternocleidomastoid muscle, already diseased, resulting in wry neck; fracture of all the long bones of all the extremities, rupture of the cord, tearing of the cord from the belly, etc.

The most common dangers, however, and therefore the most important, are asphyxia from abruptio placentae or prolonged compression of the brain, and intracranial hemorrhages. Brothers of New York found that 5 per cent of children died during labor. Holt and Babbitt of New York, 4.4 per cent, Schultze, 5 per cent, and 1.5 per cent in 24 hours from the trauma of labor, Kerness of Munich found 5.2 per cent, and Potter of Buffalo had 4 per cent fetal mortality. A certain portion of these deaths occurs in natural, unassisted labor. How many babies are hurt and damaged in operative delivery cannot be determined but their number is legion,—and the same must be said of the effects of natural labor. Anyone who has thonghtfully studied the head of a child moulded by strong pains through the tight pelvis of a primipara, will agree with me that the brain has been exposed to much injury. The long sausage-shaped head means that the brain has been dislocated, the overlapping bones indicate that the sinuses have been compressed with resulting cerebral congestion; the caput succedaneum evidences the pressure to which the brain was subjected. If there is a caput on the outside of the skull what of the inside? The punctate hemorrhages in the skin confirm the last mentioned finding; the subconjunctival ecchymoses show us the possibility of hemorrhage into the retina. From outward, visible evidences, therefore, we can deduce that the brain has suffered distortion, congestion, edema, compression and hemorrhages, but we need not rely on deduction alone. Clinically, if you listen continuously to the fetal heart tones, you will be convinced that the child is suffering, and autopsies bring the final proof of the above assertions. Neurologists for many years have pointed out the connection between epilepsy, idiocy, imbecility, cerebral palsies and prolonged hard labors. Observant obstetricians have known this for so long that it is an accepted fact. In 1917, Arthur Stein of New York reviewed the literature on the subject; he studied 5,562 cases in various homes for feeble minded children, and comes to the conclusions given above. Indeed, although the statistics are meagre, they seem to show that instrumental delivery is safer than prolonged, hard, unassisted labor. Stein's article is well worth reading, as it quotes numerous accoucheurs and neurologists of scientific standing who support this view. One may well ask himself whether the short, and moderate in amount, compression of the head in a skillfully performed forceps operation, is not less dangerous to the integrity of the brain than the prolonged pounding and congestion it suffers from a hard spontaneous delivery. If a late forceps operation is done on a head and brain already infiltrated with small hemorrhages, the results are worse, compounded

Anoxemia (anaerosis—the beginning of asphyxia) of the child in the second stage is a not uncommon condition, but fortunately most children are born before the asphyxia becomes fatal. In the Chicago Lying-in Hospital, hardly a month goes by, but what one or more infants die from this cause. Either the child is still-born or dies a few minutes after birth, or dies within the week from atelectasis. Most so-called blue babies are simply atelectatic.

The asphyxia may be primary,—from separation of the placenta, pressure on the cord, tetanic action of the uterus, etc., or it may be secondary to cerebral compression or hemorrhage. Its beginning and progress may readily and easily be determined by means of the stethoscope, industriously applied during the second stage. Another result of asphyxia in labor is infection of the fetus. In gasping for air the child inspires vaginal mucus, and later develops pneumonia or intestinal sepsis.

Among the late effects of prolonged labor must be mentioned permanent disorders of the special senses, sight and hearing, due to hemorrhages into the nerve endings, the nerve itself, or its nuclei. Fetal deaths and all the complications are more frequent in primiparae, as would be expected, even if the statistics and the history of primogeniture did not bear out the truth of the statement.

Now what can modern science do to prevent these dangers to the mother and to the child?

This brings us to the treatment of the second stage of labor. Much can be done, and the proper care of the second stage is the crowning achievement of the modern obstetrician,—not the spectacular performance of Cesarean section. I will pass over with mere mention those things which are routine in the management of this period,—the practice of an aseptic technic, the administration of anesthetics, the watchfulness for symptoms of rupture of the uterus, of acute cardiac decompensation, of impending nervous exhaustion, eclampsia, abruptio placentae, and mechanically obstructed labor, all of which are sufficient to engross the whole attention of even the cleverest accoucheur,—and I will discuss particularly the preservation of the pelvic floor and outlet tissues, and the prevention of injury and death to the child.

The first prerequisite for success is the appreciation of the above described dangers; the second is their recognition in the individual case, then follows the application of our present knowledge of artistic delivery under the protection of a highly refined aseptic technic.

The question at once arises,—shall we depart from our old, trusty, time-honored "watchful expectancy," i. e. waiting for distinct signs of distress on the part of the mother or babe before interfering,—or should we anticipate these dangers and, as a routine, cut short the second stage by a surgical delivery?

The most radical apostle of early surgical delivery is Potter of Buffalo. In all cases, as soon as the cervix is fully opened, (and ofttimes before) he performs podalic version followed by immediate extraction. This practice has, and in my judgment, justly, evoked a storm of disapproval. In Potter's hands (perhaps, I am not sure), the operation is safe, but in less skillful hands there will undoubtedly be a long train of dead and damaged babies, ruptured uteri, and torn soft parts. The same may be said, though with considerably less force, to what I will recommend for the obstetric specialist,—the operation of "prophylactic forceps."

Most obstetric writers discuss the length of time one should allow the second stage to continue, and advise the use of forceps after a period of two, three or more hours. Others determine the time of interference by the signs of suffering of either patient, or by evidences of actual danger to either. It must be "watchful expectancy" until then, and, in spite of what I will say later on, I still believe this is the safer plan for the young practitioner, for the occasional accoucheur, for the family physician. Only I recommend as a much closer "watchfulness" so that the signs of danger may be recognized earlier than at present is the case. I still believe that "watchful expectancy" and natural delivery will give the best results in the conditions in which the vast majority of births occur, and that the indiscriminate use of forceps, of pituitrin and of forced delivery will do, as they are doing now, immeasurable harm.

As far as my own present practice is concerned, I may say that it is more active than formerly and that I make frequent use of the "prophylactic forceps." In primiparae and in multiparae with rigid pelvic floor, I shorten the second stage artificially. When the head has reached the pelvic floor and the levator ani muscles have begun to stretch, I consider the advisability of interference. If the pains are strong, a few extra whiffs of ether or gas are given and a deep episiotomy is made, in the manner about to be described. The patient will

then deliver herself, or if the pains lag, two or three drops of pituitrin are given. If the pains are not strong, or if the head reaches the pelvic floor after a second stage lasting longer than I feel it should, say 45 to 60 minutes, or if the rotation is not complete within this time, I do the surgical delivery or "prophylactic forceps." Under complete ether anesthesia, the pelvic floor is incised, the head rotated anteriorly, and delivery effected. Just after the head is brought out of the vulva, the patient is given 1 c.c. of Burrough and Wellcomes' petuitrin, hypodermically. In a few minutes the uterus contracts and expels the placenta into the upper vagina from which it is expressed by one hand exerting pressure on the fundus, the other hand being placed in the vagina for the placenta to slide on, in the manner that the heel slides down on the shoe horn. We call it "the shoe-horn maneuver." Immediately the placenta is delivered a full c.c. of aseptic ergot is given intramuscularly. It is remarkable how little blood the woman loses when the labor is treated thus, and I think much of the rapid recovery the women enjoy, is due to the preservation of their blood supply. Much, too, I ascribe to their freedom from the hard physical labor of the second stage.

As soon as the uterus has contracted well and the oozing has stopped, a careful palpation and inspection of the lower uterine segment and cervix are made. Cervix tears are repaired at once. The general notion of the pathology of cervical laceration needs revision. The cervix from embryologic, anatomic and clinical studies, is made of two plates of fibres and muscle tissue, united at the sides by thinner masses of the same fibres. Tears usually occur at the sides,—one or both, and the body of the cervical tissue retracts from the edges. Sometimes the mucous membrane, both inside and outside, does not tear, but the body of the cervix tears and months later we find a patulous os. These various mechanisms of cervical tear are shown in model No. 5. Only in exceptional cases and in tears of small degree, or when the cervix is edematous and is cut, do we find the flat surfaces to unite that are usually described in our textbooks. It is important to know these vagaries or cervix tears, because, unless they are recognized, and the suture adapted to each particular, the union is unsatisfactory, and a good operation falls into disrepute.

The Perineotomy. This is one of the most important parts of the prophylactic forceps, because it is intended to preserve the integrity of the pelvic floor, the subvesical fascia, the urogenital septum and at the same time prevent injury to the child's brain. It is the main portion of the prophylaxis. I will assume that the operator knows his anatomy well. Just the right time to make the incision is not so easy to determine. I like to wait until the levator ani and fasciae have been stretched a little, but have not begun to tear. I have not yet learned how to grasp the correct moment in all cases. Better too soon than too late. Beginning at the raphe in the fourchet, the skin and urogenital septum are cut with one sweep of the scissors. This exposes the levator ani pillar. The perineum falls to the opposite side, its apex attached to the fascia over the rectum and to the edge of the levator ani. Next the vagina together with the fascia over the levator ani are incised. Be sure to recognize the fascia and incise it with the vagina. This bares the levator ani pillar as plainly as is the rectus muscle, in the pararectal abdominal incision. Then the levator is cut more or less extensively depending on the estimated size of the child. The cut is made almost horizontally in about the middle of the muscle. Bleeding is stopped by pressure with gauze sponges,—occasionally a vessel needs tying. For novices I recommend putting temporary sutures through the various structures, before cutting them, to render later identification easier, since sometimes the stretching of the wound by the head causes the muscles to tear away from their places in the fascia. In the repair we simply unite the parts in anatomico-surgical fashion. The vagina is closed with a running submucous catgut suture having a care to get the fascia over the rectum. With an extra rubber gloved finger in the rectum, puncture of this organ is avoided. Then the levator ani is sewed with 2, 3, or 4, 40 day catgut interrupted sutures, inserted also under the protection of the rectal finger. Next the urogenital septum is reunited by catgut—running 20 day catgut, and the end of this suture meets the end of the subvaginal suture at the

apex of the perineum. These two are tied together, eliminating one knot. Next a running suture of No. 0 catgut closes the fat and the superficial fascia and finally the skin is closed by a subcuticular silkworm gut, the ends being left long. Where there is a suspicion of infection, or a vaginal discharge, it is not wise to sew up the wound as here described. The vagina is closed with interrupted catgut sutures and the levator ani, the urogenital septum, and the skin all brought together with silkworm gut, figure of eight sutures, the first loop of the 8 grasping the levator, the other loop the septum and skin. Where infection exists, no suture is attempted at this time, but in such cases prophylactic forceps does not come into consideration. There are other indications to be met.

As regards the forceps delivery, one important injunction is needed. The standard rules apply. Especial care is to be taken that the child suffers no injury or asphyxia from an interference instituted to save it from both.

With the head stethoscope, soon to be described the condition of the child is narrowly watched from the beginning to the end of the operation. After the forceps are locked, the rate of the fetal heart is noted, then the handles of the instrument are compressed. If the heart is not affected or only slightly slowed, it means that the child is not endangered and the delivery may be accomplished without hurry. If the beat gets suddenly and much slower, the cord has been grasped by the tips of the blades. A reapplication of the forceps is demanded, or the delivery must be hastened. Before every single traction one listens again to the heart for the danger of shutting off the fetal circulation through gripping the cord must be avoided. There is room here for the exhibition of high obstetric skill. The amount of compression of the brain by the forceps should be the least necessary to hold the head securely. "With art, not with strength," saves the baby's brain; the head stethoscope and available obstetric measures prevent asphyxia.

Now, the writer freely admits that this method, the prophylactic forceps operation, is a radical departure from time honored custom and must have really sound scientific basis for recommendation. This it has. First, it saves the woman the physical labor of a prolonged second stage, and in the modern nervous debilitated product of civilization, this is becoming more frequently necessary. The saving of blood, already referred to, has much to do with the quick and smooth recoveries I have observed in my cases. In the combination of morphine and scopolamin in the first stage, gas or ether in the second, with operative delivery, we have robbed labor of most of its horrors and terrors, and we ought thus to favor the increase of the population.

Second. It undoubtedly preserves the integrity of the pelvic floor the vesico vaginal septum and introitus vulvae and forestalls the long train of sequellae previously mentioned. I regret that I cannot show you some of the cases delivered in this fashion. Virginal conditions are often restored. Some might say that this is a disadvantage.

Third. It saves the babies' brains from injury and from the immediate and remote effects of prolonged compression. Incision in the soft parts not alone allows us to shorten the second stage, it also relieves the pressure on the brain and will reduce the amount of idiocy, epilepsy, etc. Prophylactic forceps also prevents asphyxia, both its immediate effects and its remote influence on the early life of the infant.

There is only one objection to the innovation and I regret that it is a real one,—but it will be, let us hope, only temporary. Prophylactic forceps will be made an excuse by unskilled, conscienceless accoucheurs, for the hasty termination of labor, not in the interests of the mother or babe, but for their own selfish ends. I fear that there are already too many such forceps operations, and therefore, I hesitated long before I decided to publish this method. But I have always felt that we must not bring the ideals of obstetrics down to the level of the general, the occasional practitioner,—we must bring the general practice of obstetrics up to the level of that of the specialist. Let us trust each man to do honestly according to his limitations. For the one, watchful expectancy, for the other, prophylactic forceps.

In closing, a few words regarding the value of the head stethoscope in discovering danger to the fetus. This instrument I devised follow-

ing a suggestion of my associate, Dr. D. S. Hillis, and it has many good attributes. It is worn on the head during the delivery and one can listen repeatedly, indeed, almost continuously to the child's heart with a minimum of effort. It obviates the need of an assistant to watch the fetal heart tones when the operator is scrubbed up. It aids hearing the sounds if the mother has noisy respiration, or the operator is a little deaf; it eliminates the humming muscle sound usually so annoying when the stethoscope is held by the hand; one can compress the tissues firmly and thus get nearer the baby's heart; the sense of hearing is aided by having bone conduction in addition to air conduction. The greatest benefit of the instrument, however, is the ease and comfort with which one can listen to the fetal heart. There is no excuse now for neglecting this part of the accoucheur's duties. All he has to do is to bend his head over the abdomen and he can learn all about the baby's condition. The heart is a good index of the suffering of the child. If the fetus is in danger of asphyxia, it will slow up or get faster, depending on the type of anoxemia. If the brain is being subjected to injurious pressure the heart will be alternately slow and fast, or irregular; if minute hemorrhages or larger hemorrhages occur in the brain the heart will get progressively more rapid. Irregularity of beat, abnormality of rhythm, variations in strength of beat all indicate that the child is suffering and apprize the accoucher that something must be done. The field thus opened by the use of the head stethoscope has not been sufficiently studied, but we already have discovered many interesting facts and there is promise of more. The widespread use of this instrument will save many babies' lives.

DISCUSSION

DR. FRED L. ADAIR, Minneapolis: It has been a pleasure to listen to Dr. DeLee's very able and comprehensive paper, and it is likewise a privilege to discuss it.

I wish in the first place to make a few general remarks about pregnancy and labor as a pathologic process. Judging from the decline in the birth rate and the increase in the percentage of sterility and of small families, pregnancy is coming to be considered as a pathologic process and perhaps contraceptives and abortions are regarded as physiologic.

It is too bad the general level of obstetric practice has not shown greater improvement. The results should be very much better. It is true that maternal mortality has been lessened by precautions taken to prevent infection, but deaths from other causes have not been decreased so much and there is still far too much morbidity and disability as a result of childbirth.

If we consider stillbirths and the neo-natal mortality, we find that there has been practically no reduction for many years, while during this time there has been a very considerable reduction of infant mortality during the first and second years of life.

I wish to emphasize the fact that the reduction of the stillbirth rate, as well as the neo-natal mortality, is for all practical purposes an obstetric problem. The responsibility for saving as many of these lives as possible rests on the shoulders of those who should provide proper care for the mother and offspring during pregnancy, confinement and the puerperium.

Dr. DeLee has pointed out to us how some of these dire results may be avoided by a proper management of the second stage of labor. It behooves all of us to give heed to his advice. We should all recognize frankly that injuries to the pelvic floor are common, and that they occur frequently in the practice of all who have anything to do with delivering women. In my experience practically every primipara has more or less injury to the pelvic floor.

There has been an altogether too common teaching that it is possible to prevent lacerations of the pelvic floor, and that it is more or less of a reflection on the ability of the attendant to have a tear which it is necessary to repair. We should recognize that these injuries are common, that they should be repaired, and that it is a disgrace not to repair the injury to the best of one's ability.

It is well to understand that our civilization tends to make physiologic processes more or less pathologic. This is not only true of obstetrics but also of many other processes. It is a normal function to drink water but it is not so to drink contaminated water. It is not physiologic to eat some of the food which civilization provides for us and such a dietary is the cause of much pathology. We have to devise ways to thwart this conversion of physiologic into pathologic processes.

The operation of episiotomy is one of these means. It is made necessary because of a disproportion between the size of the head and the soft part, and because of a faulty relation between the expulsive powers of labor pains and the resistance of the pelvic floor. I have not time to discuss the many important points brought out in the paper, but I wish to say a few words especially with reference to

the indications for its performance. This operation shortens the second stage of labor and is in many cases beneficial to the mother as well as to the child.

How are you to detect dangers to the mother, and how are you to recognize danger to the child? Dangers to the mother from a prolonged second stage might be divided into those that are general and those which are local. General dangers are detected more easily through the heart and pulse perhaps than in any other way. This necessitates attention to the mother's heart and pulse.

So far as the local injuries to the mother are concerned, they comprise practically injuries to the pelvic floor during the second stage of labor. At least, they are the most common. There are other dangers which have been pointed out by Dr. DeLee. How do you recognize danger to the pelvic floor? By failure of the head to progress; it becomes stationary and more or less fixed on the pelvic floor. The tissue become tense, and by pressure on the tense tissue you find definite interference with the reestablishment of circulation in the perineum. You find that you have beginning edema of the perineum; then it is time to interfere for the sake of the local condition in the mother. You also find that the head recedes and comes down and if you find a little blood stain on the head which is due usually to a break of the mucous membrane of the vagina, it is an indication for performing an episiotomy. You should watch the perineum because it is being injured and gives a definite indication for operative procedure.

Unfortunately, all injuries to the pelvic floor are not accompanied by extensive lacerations, and not always by any laceration so that immediate diagnosis is not easy. We have injuries which are more serious as the result of very prolonged pressure of the head on the tissues of the parturient canal. This is recognized particularly by the condition of the parts of the mother, and also by the condition of the head. You can watch the scalp circulation as carefully as you can watch the perineal circulation. When pressure on the head with your finger fails to give a prompt response in the vessels of the scalp, that head is being subjected to a great deal of pressure. When the head is persistently cyanotic and there is beginning edema of the scalp, the child is not only in danger, but you also know the tissues of the mother are in danger because of the great pressure on them. Both of these can be relieved by episiotomy. We should follow definite indications in the treatment of this class of cases.

Of course, the fetal heart should be carefully watched as it gives the best indication of the condition of the child. We are all, I am sure, greatly pleased to have heard Dr. DeLee's excellent paper.

DR. WILLIAM H. CONDIT, Minneapolis: I surely feel highly honored in having the privilege of discussing such a scholarly and technical discourse as Dr. DeLee has given us.

The author made two marked impressions upon my mind as I listened to the many dangers attending the passenger, and the passages concerned in the birth of each new life.. First, the tremendous odds against our safe arrival (especially the age in which most of us here arrived) hence, we should thank the Lord that we are all here (laughter). Second, the importance of the proper surgical repair of the damaged passages of the mother. Not many years ago my teachers taught me that the repair of the pelvic floor was an interne's job, pure and simple, and as soon as he graduated and took up his internship, he was assigned the operation and considered an expert after one good job. We surely have a different idea of the operation after this detailed description so graphically presented with the aid of Dr. DeLee's beautiful models. The damage to the passages is so much easier prevented and repaired than the injuries occurring to the passenger, especially those to the brain of the infant leaving permanent deformities to haunt us as very unpleasant memories of our part in the crime. I have one, not twenty-five miles from this city in which two decompression operations were necessary in a vain attempt to relieve a general spastic paralysis in a child nine months old. This case was the result of a stormy tetanic labor where surgical anaesthesia failed to relax the terrific uterine contraction that was pressing the life out of the child's brain. All possible was done in this particular case to prevent damage to the brain, but there are many who could escape, with proper care at delivery directed at relief of prolonged or stormy labors. Kearney estimates that intracranial hemorrhage at birth is responsible for 70 per cent of the spastic type of paralysis in children and 20 per cent of the resulting idiocy and feeble-mindedness now existing; he urges the importance of an examination of the eye grounds in infants after difficult labor. Of 1,387 children having spastic paralysis, of ages varying from one day to twenty years, 287 showed distinct edematous changes; 21 per cent showed distinct signs of increased intracranial pressure.

In the 287 treated by decompression operation the mortality was 10 per cent; nine were operated on the first day of life with one death; six were operated the second day after birth; three on the third day with no mortality in either. This for the surgical side. The preventive treatment depends upon—First: the skilled use of the stethoscope as Dr. DeLee has illustrated with his improved headpiece. It is very important that you have one to fit your own head and ears that you may be able to detect the foetal heart sounds clearly. If we can so develop and teach this art as to be able to make a diagnosis of brain injury by the foetal heart condition as Dr. DeLee says is possible, we have made remarkable advance. Second: we may assist the mother in her labor, slowing it if too stormy, by use of proper anesthesia,

recognizing abnormalities of the passages, stimulating prolonged soft labors; third, by prophylactic forceps preventing the final fatal damage to a brain that may be mildly injured.

I am much encouraged to have Dr. DeLee give us this method he terms prophylactic forceps. I have been using this means of assisting the mother in her last, most severe suffering of her labor, but without publicity, fearing it might be considered meddlesome operating, but I have so far had no regrets, no infection, and shall continue this method with far less hesitation.

Finally, prevention of the continuing of a small brain hemorrhage by the subcutaneous injection of the blood of one of the parents of the child, preferably the mother's. This no doubt prevents many a fatal issue. We know the end results of these injuries to the vessels of the brain, namely, meningeal hemorrhages, small insidious and resembling pachymeningitis; a large hemorrhage suddenly fatal or small multiple hemorrhages organizing into permanent clots or causing cystic degenerations of the brain tissue. Since we cannot as obstetricians, become expert ophtholmologists, heart, or nerve specialists, or have a member of each specialty at our elbow, at each and every delivery; why not routinely use the subcutaneous injection of a small quantity of the mother's blood into every child as soon as delivered; if not in all, in those where the least suspicion of a brain injury appears.

This treatment can do no harm and might, by increasing the coagulability of the foetal blood, check instantly an unrecognizable hemorrhage.

DR DELEE (closing the discussion): Dr. Condit spoke of hemorrhages in the brain with hemorrhages in other parts of the body. Hemorrhages in the brain can be the cause of hemorrhages in other parts of the body. V. Herff has proven in animals that damage at the base of the fourth ventricle will result in hemorrhages of the bowel.

Dr. Adair spoke of labor as a pathologic process, but I could not gather whether he meant that considering it so would cause a slowing up or improvement in the birth rate. As a fundamental reason why obstetrics is on such a low plane, the fundamental cause of our high mortality, (and there is an unavoidable mortality in childbirth) and the fundamental cause of the present lack of improvement in mortality of the mother is the fact that the public does not recognize that confinements are pathologic. If labor were raised to a dignified plane in the eyes of the public, they would not permit midwives to practice obstetrics, but they would demand that the obstetrician or accoucheur be as well versed in his art and practice as any surgeon, and then we could hope for a reduction in our mortality and morbidity, but not until then. As long as labor is only regarded as simply a function that any old woman can attend to, just so long will our state legislatures refuse to enact the necessary laws to prevent all these troubles.

THE SURGICAL TREATMENT OF BUNIONS*

By C. H. Mayo, M. D.,
Rochester, Minn.

The value of good feet is not appreciated until middle age when they are compelled to carry a greater weight than during youth and when new shoes must be fitted to the feet rather than the feet to the shoes as is the second and third decades of life when the feet have often become molded to abnormal types of shoes. Shoes are often too short or misshapen at the toe, causing the joint of the great toe to turn outward, and thus developing a hallux valgus. The deformity is in females in the majority of cases. A heel two-and one-half inches high makes it neeessary to walk on an inclined plane. This enlarges the sesamoids and at times even develops them under fifth metatarsal head.

Hallux valgus is a very common deformity in which the great toe overlaps or compresses the second and third toes (Fig. 1). It is often associated with some degree of bunion. Bunion, except of the bursal type, rarely occurs without hallux valgus. The overgrowth of bone (Fig. 2) on the inner side of the first metatarsal bone is immediately back of the artieulation. This has been generally attributed to intermittent pressure; nevertheless in an x-ray picture of the foot with severe hallux valgus and deformity from bunion shows a wide space between the heads of the first two metatarsals (Fig. 3). If the growth of bone were due to an intermittent pressure bony deformities would occur in other regions subjeeted to intermittent pressure, for example on the shoulder of the hod carrier or beneath the eollar of the work horse. Is this overgrowth a protection incident to the deformity, hallux valgus, and an effort on the part of nature to protect the exposed or lightly eovered inner side of the articulating head? It is more probable that this overgrowth at the terminal whirls

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Fig. 1. Bunion foot.

of the capillary circulation where the joint capsule is attached to the periosteum is of the same origin as the overgrowth which occurs in rheumatoid arthritis, a mild chronic infection, the localizing factor being that of traumatism, since such growths occur and increase during the period of life in which rheumatism and recurring infections occur. The various shapes of feet and the limited number of shapes of shoes are undoubtedly responsible for the development of bunions and hallux valgus, conditions which occur more commonly in feet in which the great toe is longer than the second and third supporting toes, since the leverage action of the misshapen pointed and too short shoe turns the joint outward. Bunion rarely occurs on a foot whose great toe is shorter than the second and third toes, namely the square foot.

Flat-foot is a common deformity, either congenital or acquired. Persons of the colored race naturally have a low arch; the outline of the imprint of a wet foot indicates that the majority of them are flat-footed. The claim is possibly correct that the negro has more of the fatty pad on the sole of the foot beneath the instep than the white man, and that the flat-foot in this naturally bare-footed race is more apparent than real and serves somewhat the purpose of the frog in the horse's foot. In later life flat-foot may develop from the breaking of the arch, or slow giving way of the arch, a condition which is associated with arthritis more commonly than is supposed, and which belongs to the period in which bunions develop. The complication of flat-foot with bunion is serious as recovery from operation is slower and the degree of benefit is much less than in cases without this complication.

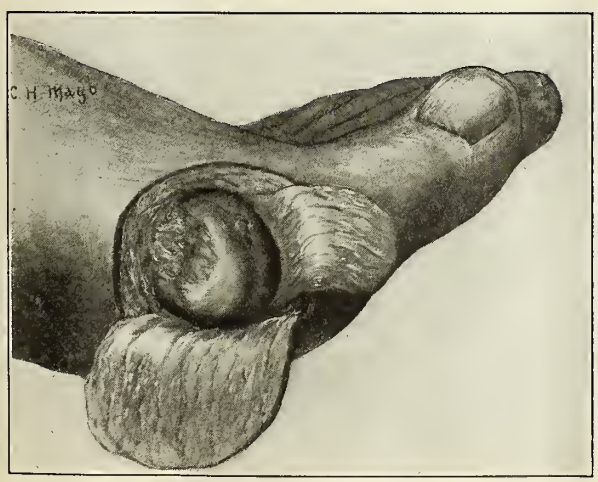

Fig. 2. Bony deformity in bunion.

Fig. 3. X-ray of foot with bunion showing exaggerated space between inner and outer metatarsal bones and displaced sesamoid wedges.

Beneath the head of the great toe are the triangular sesamoid bones on either side of the flexor tendon. They are half an inch long and one-quarter inch wide. I believe Robinson is correct in his assumption that on displacement of the flexor tendon in hallux valgus the sesamoid bones slip to the inner side of the head of the great toe and become a bony wedge at each step, sliding the joint of the great toe inward. This change of position is definitely shown when the body weight is added at the time the x-ray is taken (Fig. 4).

Fig. 4. X-ray of foot with bunion showing lateral view of sesamoid.

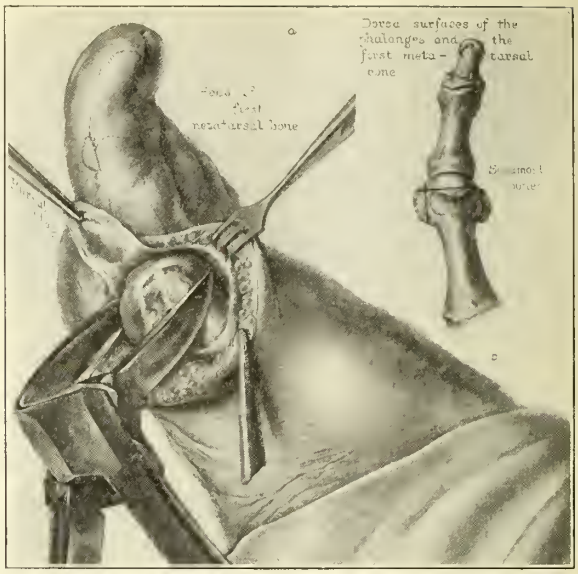

Fig. 5 (a) Removal of head of metatarsus. (b) Angle at which head of metatarsus is removed, showing short incision at right angle to long incision.

There are several methods, according to the condition, of the treatment of bunion:

1. Simple excision of the bunion bursa. Few operations are done in this early stage.

2. Exeision of the bursa with removal of the inner side of the head of the first metatarsal.

3. The removal of all, or nearly all of the head of the first metatarsal. This procedure is too radical.

4. The Keller operation in which the bony growth with the bursa are removed. Tendon relaxation is secured by removal of the concave articulating surface of the first phalanx.

5. The Robinson operation for removal of the sesamoid bones, the bunion bursa, and by means of bone forceps, the removal of the over-growth of bone.

6. The usual operation performed for the relief of bunion is one I advocated many years ago for shortening the great toe and relaxing the extensor tendon; one quarter inch of the articulating surface of the head of the metatarsal bone is removed (Fig. 5) and motion is maintained by turning the bunion bursa into the joint in front of the divided bone surface after the removal of the bony overgrowth (Fig. 6). This was one of the first arthroplastic operations devised for articulating joints to maintain motion after severe surgical traumatism. The operation has been most successful except in eases of marked flat-foot in which the pain of bunion is increased by a fallen arch complicated by mild arthritis. In such cases of flat-foot, hallux valgus, and bunion, I believe the head of the bone should be perserved, the bunion bursa, the overgrowth of bone, and the sesamoid bones should be removed (Fig. 7). If the hallux valgus is marked the tendon of the extensor hallucis longus is split for one-half inch over the joint and sectioned at the top on the inner side and at the bottom on the

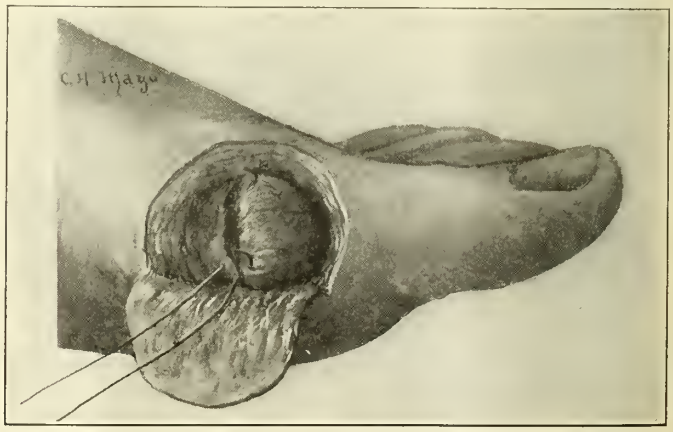

Fig. 6. Suture to hold bursa in joint and straighten the toe.

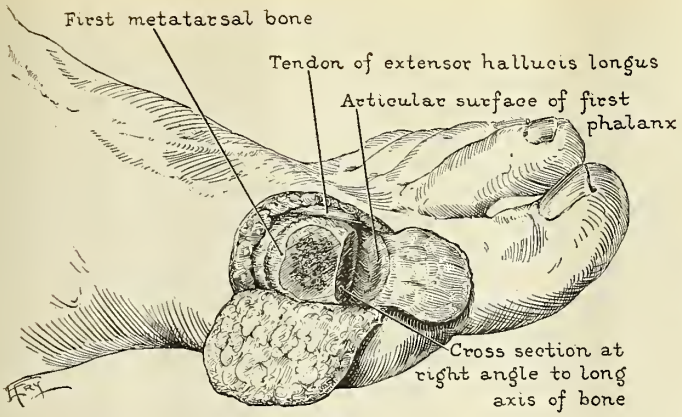
First metatarsal bone
Tendon of extensor hallucis longus
Articular surface of first phalanx
Cross section at right angle to long axis of bone

Fig. 7. Excision of bony overgrowth and part of the head of the bone with preservation of the bursa.

outer side; the divided split tendon is allowed to slip one-quarter inch and is resutured.

Persons with hallux valgus and normal or possibly lowered arches are operated on by making a curved incision convexly upward over the inner side of the joint. The skin is deflected downward, the bunion bursa is dissected forward and the joint opened, the bursa being left attached to the inner surface of the first phalanx. One quarter inch of the head of the articulating surface is removed by bone saw or large bone-biting forceps. This relaxes both extensor and flexor tendons. The bony projection on the inner side of the head of the great toe is removed and the bunion bursa turned into the joint and held by sutures of catgut which also serve to straighten the great toe, thus removing the valgus. The wound is closed without drainage (Fig. 8). If the bunion is complicated by a marked flat-foot and hallux valgus I believe that the Robinson operation of removal of the sesamoids is indicated; the incision is the same, and the bunion bursa with the bony overgrowth are removed. If the great toe is bent downward the white flexor tendon with the yellower surface of the sesamoids may be seen on each side of it. These bones can be removed with a knife or sharp pointed scissors if they are grasped with strong tenaculum forceps. In some cases of marked hallux valgus the extensor tendon should be lengthened.

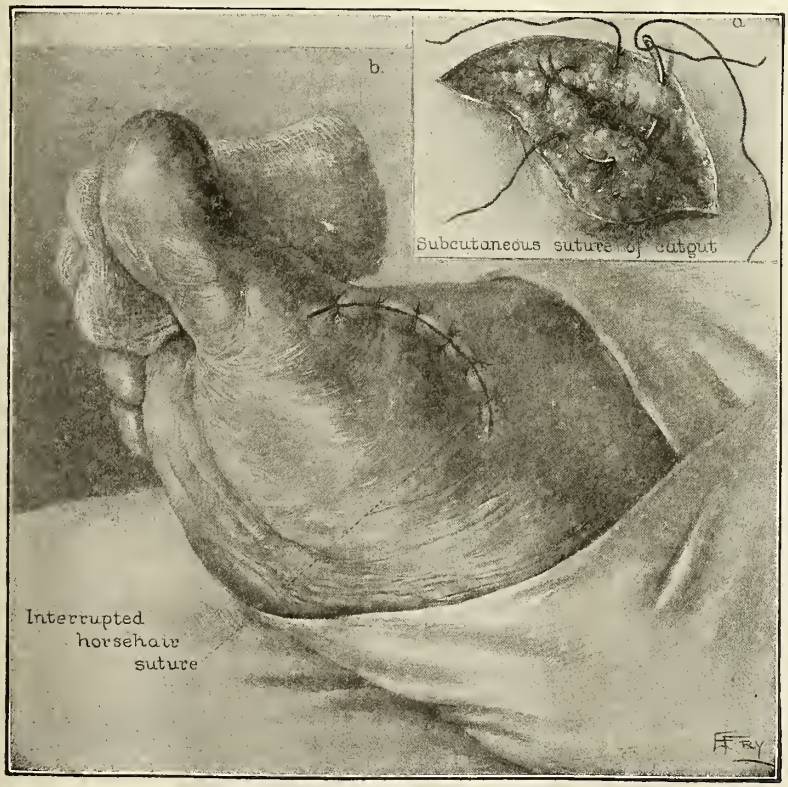

Fig. 8. Closure of the wound.

It should be explained to patients who have flat-foot complicated with bunion that they have an added trouble which will delay the relief ultimately to be obtained. The sesamoids and the articulating surface should not be removed from the same foot, and for the majority of patients the operation I described first is more satisfactory. Early use of the foot following these operations is indicated. The patients should be up early, and at the end of the first week, using the heel and outer side of the foot. As soon as possible, often within fourteen to twenty-one days, a stiff-soled shoe may be worn.

The operation is safe, easy of accomplishment, and the results are good. The operation should be advised more frequently. Advice should also be given with regard to the size and

shape of shoes to be worn following the operation.

It is to be hoped that the many surgeons interested in orthopedics as developed by the war will use their influence both on the manufacturers and the wearers of shoes to secure an improvement in the shape and length of shoes and thus aid in the prevention of many foot troubles which are wholly due to faulty fitting during early life.

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DISCUSSION

DR. A. R. COLVIN, St. Paul: Some celebrated surgeon has said that there is no such a thing as minor surgery, and the fact that Dr. Mayo undertakes to present a subject like this means that he considers the treatment of bunions an important surgical procedure.

There are four elements that enter into the consideration of bunions: (1) Deformity, (2) Bursitis, (3) Exostosis, (4) Arthritis.

The deformity known as Hallux Valgus is in the vast majority of cases due to the wearing of a narrow pointed shoe which forces the great toe outward. The bursitis is nearly always due to the shoes which produce pressure on the region of the head of the metatarsal bone, that is it is a traumatic bursitis, it may of course, be secondarily infected.

The exostosis is in time due to the irritating effect of pressure and the irritation of the overlying inflamed bursa, both of these causes acting upon the underlying bone stimulate osteogenesis and an exostosis results; a vicious circle is then established, the projecting exostosis exposes the bursa more readily to pressure trauma and the aggravated bursitis goes on stimulating bone production. The arthritis is due to faulty strain upon a deformed joint and the resulting irritation produces a hypertrophic condition of the head of the metatarsal bone.

The treatment of these cases must be based upon etiological and pathological considerations. Inasmuch as we are usually consulted regarding the established condition, a consideration of prophylaxis would seem to be unnecessary, but unless the patient is sufficiently impressed as to causative factors he will after operative measures have been undertaken reproduce both the deformity and the bursa. It has been said that "a surgeon is a physician who operates", this is even more true now than when it was said. Much can be done for bunions that is not operative, one sees occasionally a patient who is the subject of marked deformity and marked bursitis who is willing to wear shoes large enough to avoid pressure and who are thereby not cured of the deformity but they do experience complete relief from suffering and do not need operation. One may say that there are very few who cannot be relieved by wearing suitable shoes. The bursitis is in the majority of cases the cause of suffering, it is a very simple matter to remove it and if there is an exostosis this should be removed, this may be done in many instances without opening the joint. The deformity it must be remembered is not usually a cause of pain and need not always be corrected. If, however, there is as well a hypertrophic arthritis the deformity and the arthritis are dealt with by the same measure, that is removal of part of the head of the metatarsal bone.

Dr. H. W. Meyerding, Rochester: I believe we should limit the term "bunion" to an enlargement of the bursa over the head of the first metatarsal bone. This bursitis may be traumatic, giving rise to pain and may require excision, or it may become infected when drainage is necessary.

Hallux valgus, turning of the great toe toward the other toes, causes a prominence of the head of the first metatarsal which may or may not be accompanied by enlargement of the head of the metatarsal. The displacement of the great toe outward produces a joint incongruity, the proximal phalanx articulating laterally with the metatarsal head. This displacement of the phalanx carries outward the flexor hallucis tendons and sesamoid bones which are developed in them. The tendons in contracting tend to pull in a straight line. Thus the tendons of the great toe in the long standing cases of hallux valgus come to lie between the first and second metatarsal bones. This is a result rather than a cause of deformity. In this position, continual weight bearing forces them between the first and second metatarsal heads and the pull of these tendons only serves to increase the deformity by pulling the great toe more toward the other toes. This is especially true when the fore-foot is squeezed in modern shoes and forced to bear an excessive weight as with the high heeled pointed toe shoe. In such instances, it must be obvious that this displaced sesamoid crowded between the metatarsal heads would produce added pain and discomfort and if found impossible to replace it in its normal position after operation for the hallux valgus sesamoidectomy would be advisable.

Dr. Mayo devised an operation which consisted of partial removal of the head of the first metatarsal and insertion of a flap. This operation has given great satisfaction in our hands. I believe operation should only be done when there is definite pain and deformity. We do not operate on patients who desire operation for the cosmetic effect.

The postoperative care is of considerable importance. Immediately after the operation the toe should be splinted so as to keep it in extension, and straight forward in line with the metatarsal bone. Patients usually are able to be up and about, walking on the heel and outer side of the foot, in five to seven days. A proper shoe which allows the great toe to maintain

its normal position should then be fitted with a moderately high heel.

Practically all operations for hallux valgus, including the Robinson operation, remove the deformity and that deformity with its superimposed enlarged bursa, is, in my opinion, the principal cause of the pain and discomfort, although we must recognize that a displaced sesamoid lying between the fourth and fifth metatarsals, constantly irritating, can also be a factor in the production of pain and disability.

TUMORS OF THE GREAT OMENTUM*

By A. L. McDonald, M. D.
Duluth, Minn.

Modern text books on abdominal surgery gives little or no consideration to primary surgical lesions of the great omentum. Judging from this and also from the infrequent case reports in the literature one would conclude that such lesions are exceedingly rare. However, when the surgeon is brought into contact with a large tumor of the omentum, he has ample food for thought. Following such an experience the author has made a study of the literature for information on the subject. He presents herewith his findings and conclusions for your consideration and discussion.

Personal case. A young man thirty years of age, recently discharged from the army as physically fit. History unimportant except that at the age of twelve he had an acute attack of right-sided abdominal pain with nausea and vomiting. During the past three years he has had occasional attacks of moderate pain and indigestion, but no vomiting. He describes a sensation of fullness in the abdomen and habitually avoids fats, pork, cabbage and large amounts of bread, as these cause indigestion. During the last year has had several attacks of diarrhoea with no apparent cause. Present attack began May 4, 1919, with sudden, severe pain in the lower right abdomen; vomited once after taking a cathartic; persistent pain till May 7 when he was seen in my office. Temperature, 99.2°, pulse 90, general examination negative. Abdomen full but not distended, marked tenderness and rigidity of lower right rectus. Patient was sent to St. Luke's hospital where the evening temperature was 100.2°. Leucocytes 12,000. Urine negative. Diagnosis, acute appendicitis. Operation next morning, ether anesthesia. Incision in outer border of right rectus sheath, bloody fluid in peritoneum. Presenting in the wound was a grumous, friable mass which bled easily when handled. After enlarging the incision, it became evident that the mass extended above; nearly to the transverse colon, below to the pelvis, and laterally, from the outer border of the right rectus to the outer border of the left, but was surrounded by apparently normal, though thickened omentum. There were no adhesions either to the abdominal wall or underlying viscera. The mass was about one and one-half inches thick. The surrounding omentum was ligated with catgut and the diseased area removed, the opening being closed with catgut. The appendix was not recently diseased but showed evidence of previous inflammation. Convalescence was afebrile and uneventful. The patient returned to work after three weeks and was well when last heard from two months later.

The specimen was about the size of one's hand and consisted of fat with areas of hemorrhagic infiltration, and white opaque tissue resembling sarcoma. There was a tendency to fibrous capsule formation about the degenerated tissue. Sections through relatively firm tissue suggested a large, round-cell sarcoma. However, study of other sections and a review of some of the literature suggested a diagnosis of chronic inflammatory mass, with degeneration and infiltration of blood and connective tissue cells. The specimen was submitted to Dr. J. C. Bloodgood of Johns Hopkins who kindly made a thorough study and gave me his experience with omental lesions. Including my case, he has studied eighteen specimens which he classifies as follows: Cysts, seven cases; chronic inflammatory tumors, ten cases; and one, my specimen, which he diagnoses as sarcoma or chronic inflammatory tumor. He states that the microscopic diagnosis rests between an inflammatory lesion and sarcoma. The predominating histological picture is granulation tissue with great proliferation of endothelial cells of blood and lymph vessels, and he remarks that granulation tissue in fat is more difficult to differentiate from sarcoma than in

*Read before the Minnesota State Medical meeting, Oct. 1, 2, 3, 1919, Minneapolis, Minn.

any other tissue. He concludes. "If Dr. McDonald's case is sarcoma it is the first such primary lesion of the omentum" (in his collection). "In the microscopic study in the group of omental cysts and inflammatory tumors, we find areas very cellular somewhat resembling sarcoma but none so definite as Dr. McDonald's case."

There is so little in the textbooks on this subject that one is forced to work out his own ideas from the rather scanty literature. Growths of the omentum may be grouped as follows: 1. Secondary: metastatic cancer, which includes all cancer of the omentum; fibroids and cysts of other organs which have become adherent to the omentum. 2. Primary: benign fibroids and lipomata, malignant sarcomata, and the inflammatory or hemmorrhagic degenerations.

Secondary tumors of the omentum are mentioned only because the older and many of the recent descriptions of primary growths, really refer to metastases or direct implantations of cancer of abdominal organs, particularly the ovary, stomach or bile-passages. Considering the development and structure of the omentum it is obvious that cancer as we understand the term can not originate in that organ. Certain clinical findings and physical signs given as characteristic of tumors of the omentum in the older descriptions[1,2] are the results of metastatic cancer of the peritoneum, and in some cases involvement of the omentum was only incidental.

True primary tumors of the omentum can include only those which develop from connective tissue. These growths are rare. Murphy[3] quotes Klebs that there were only fifteen cases on record at that date, 1905. Cobb[4] states that the records of the Massachusetts General Hospital since 1870 give only fourteen cases of malignant tumor of the omentum and that twelve of these were metastatic cancer. Many cases of colloid cancer are mistaken for sarcoma. Textbooks describe cysts of the omentum as rare and usually degenerations of sarcomata (Hasbrook[5]). This is somewhat doubtful as Kenny and Mason[6], Reynier[7], and Bloodgood[8], consider many of them due to hemorrhagic or inflammatory degenerations. Dermoids are even more rare. Cobb[4] reports a case of large round-cell sarcoma and refers in detail to one reported by Matas[9] of myxosarcoma. Camus[1] refers to two definite cases and to two of "endothelial cancer," but with metastases in the liver and multiple nodules in the peritoneum, so it is doubtful if the last two were primary in the omentum. According to Camus, the endothelial tumors originate in the surface endothelium or from the lymphatics, but the primary localization of these growths in the omentum is not clear from his descriptions. In the omentum such tumors reach the size of an egg, accompanied by a massing of the structure into a transverse tumor extending across the abdomen below the stomach. The symptoms and signs are not characteristic. There is a latent period with a gradual increase in size of the abdomen, often with the accumulation of bloody ascitic fluid. The tumor is superficial, rather soft, and often not made out on account of thick abdominal walls. The intestines are forced to the sides but may to a certain extent underlie the mass, giving a comparative dullness on heavy percussion. The symptoms consist only of abdominal discomfort or embarrassed respiration due to the tumor and accompanying ascites. In some cases there was evidence of intestinal obstruction. I found no instance in which a correct preoperative diagnosis was made. Removal was attempted in Matas' case but recurrence took place within a few months, followed by death within a year.

I found reports of two cases of lipomata of the omentum, Camus[1], but it is by no means clear in the descriptions that these were localized in that structure. Some, if not all true fibroids are primarily from the stomach or colon and extend between the layers of the omentum. The only reference to such a tumor which I have found is that of Murphy[3] which was in the gastrohepatic omentum. Another group of pedunculated fibroids represent fibrous thickenings of a portion of the omentum which has become twisted on a pedicle. One of these sometimes becomes detached thus accounting for a loose fibroid described in the abdominal cavity of hernial sacs.

There is a group of inflammatory or traumatic tumors of the omentum described in detail by the French (Brunet[10], Reynier[7], Bi-

chon[11]), but to which I can find no recent reference in English. To explain the etiology and nature of these lesions, a consideration of certain points in the structure and physiology of the omentum will be of value.

The great omentum represents a folding of the two-layered posterior mesentery of the stomach, extending from the greater curvature of that organ in front of the abdominal viscera, being reflected to the level of the transverse colon where it fuses with the meso-colon. Originally composed of four layers, it forms a continuation of the lesser peritoneal cavity, a bursa in front of the small intestines, but later the layers become more or less completely fused. It has an exceedingly rich blood-supply from branches of the right and left gastro-epiploic arteries, which descend in the anterior fold to the free margin and are then reflected to the deep surface where they eventually anastomose with branches of the colica media. The veins accompany the arteries and empty into the splenic and portal veins. Injury to the vessels at the free border, from inflammation, irritation or ligation, is likely to result in thrombosis with extension, or to formation of emboli which may interfere with the circulation of portions of the omentum or be carried to the liver. The lymph supply is rich and allows for free absorption of peritoneal fluids or exudation of blood and lymph cells. The structure is covered with a single layer of endothelial cells, allowing free absorption or exudation. No epithelial tissue is present.

The function and physiology of the omentum is reasonably evident from a study of its structure. Older authors speak of it as a bursa preventing friction between the viscera and anterior abdominal wall. In this connection the omentum is normally important in preventing adhesions between the intestines and abdominal wall. On account of its free mobility, the omentum is forced into hernial openings by intra-abdominal pressure, thus tending to block such orifices and prevent intestines and other viscera from entering. Extensive endothelial surfaces together with a rich lymph and vascular supply provide for rapid absorption of peritoneal fluids. Also through adhesions and vascular anastomoses there is provision to relieve congestion in inflamed regions, or to take over the circulation of adherent tumors which may lose their original attachment, thus accounting for certain pedunculated fibroids or cysts of the omentum. By reason of the rich lymphatic network, the omentum furnishes a large per cent of the lymphocytes or leucocytes in peritoneal exudates. Through the tendency to lymph formation the omentum early becomes adherent in response to local irritation or inflammation.

The inflammatory and degenerating masses in the omentum represent a reaction to irritation, sub-acute inflammation, or disturbed blood supply. The etiology is reasonably clear in certain cases: 1. Incarcerated hernia with omentocele. 2. Torsion of the omentum with or without hernia. 3. Extension of low grade inflammation from an abdominal lesion, as appendicitis. 4. Thrombosis or embolism from such a lesion extending directly, or being carried in the circulation to the omentum. 5. Trauma to the abdomen with hemorrhage into the omentum. 6 Excision of portions of the omentum and disturbance in the circulation with thrombosis or embolism.

The resulting lesions present a wide variety of pathology: 1. Extensive changes in an omentocele. 2. Results of torsion. 3. Extension of inflammation. 4. Effects of disturbed circulation, thrombosis, infarction, or hematoma. As already mentioned, there is a tendency for the omentum to be forced into hernial openings by increased intra-abdominal pressure, where it becomes adherent and incarcerated with a constriction about the neck of the hernia. Certain changes develop in the omentocele with little or no clinical reaction. There is fibrous infiltration with overgrowth of fat. Rarely the blood supply is suddenly and completely cut off with resulting gangrene or abscess. More often the change is gradual and the ultimate stage is a fibrous tumor with some fat and frequently with small cysts. A few cases of detached fibrous tumors in hernial sacs have been described and originate from such conditions. The fibrous, infiltrated mass becomes adherent to the testicle and cord, at times extending into the abdomen forming a tumor mass of considerable size, especially when associated with torsion of the intra-abdominal portion. Now that hernias are usually operated on in the early stage, such conditions

are neeessarily rare, but there are a few reports in the eomparatively reeent literature: Brunet[9], Camus[1], Reynier[7] and Bichon[11]. Obstruction of the bloodvessels, especially veins results in varieosities, or rupture and hemorrhage into the tissue together with marked cellular infiltration. The final pieture is extremely confusing. Some of the cases originating in inguinal hernial saes were mistaken for malignant disease of the testicle, and only reeognized when the mass was followed to the omentum with its attachment to the transverse eolon (Brunet[9]). Clinically these eases are eomparatively latent for a long period, when there seems to develop an aeute eondition resulting from some change in the mass, as gangrene or inflammation. There is severe pain, abdominal distention, and sometimes fever and vomiting. In the tumor are to be found areas of hemorrhage with eyst formation, fibrous thickening, eellular infiltration, sclerosis of blood vessels, thrombosis, and often changes in the tissues suggesting sareoma. It was after reading some of these descriptions that I was inclined to revise my original diagnosis of sarcoma in the ease reported.

Intra-abdominal torsion of the omentum is discussed extensively in the literature: Brunet[9], Baldwin[12], Stewart[13], Riehardson[14], Cullen[15], Eitel[16], Corner and Pineh es[17], Bubis[18]. In the etiology we have to eonsider: 1. Fixation of the free border of the omentum by (a) hernia, either incareerated, or by adhesions about the ring; (b) adhesions to local inflammation, (Cullen[15]). As the result of such fixation, the arteries form a more or less resistant eord. Sooner or later there is disturbance in the venous circulation, with varicosities, or hematomata with thiekening, and rotation oeeurs. 2. The formation of a mass or tumor in the free hanging omentum. Corner and Pinches quote experimental work of Payr, who produeed gas eysts in the omentum and also produeed masses by injeeting paraffin, and found that torsion oeenrred spontaneously with no fixation of the free border. 3. Usually an aeute provoeative faetor, as sudden effort, coughing or trauma.

Brunet speaks of three degrees of torsion: 1. Ineomplete; eonstriction and narrowing of the vessels, especially veins, resulting in varieosities, eongestion, or hemorrhage. 2. Intermediate; more eonstriction, hemorrhage, fibrous and eellular infiltration. 3. Compiete; (a) gradual with fibrous or hemorrhagic degeneration; (b) sudden, with thrombosis and gangrene.

Symptoms in all but the eomplete stage are indefinite: abdominal discomfort due to tension on the omentum and eolon, possibly incomplete intestinal obstruetion, eonstipation or rarely diarrhoea, and in some instances a mass ean be made out. The eomplete pieture will suggest torsion of some intra-abdominal organ, with severe pain, distention, rigidity, vomiting and often, fever. A eommon pre-operative diagnosis is appendieitis or intestinal obstruetion, sinee the pain, rigidity, and mass is more evident on the right side. The true condition is rarely eonsidered sinee it is not thought of. Treatment is surgieal, usually exeision of the mass, though is one ease at least it was possible to untwist the omentum before gangrene oeeurred and eorrect the eause (Eitel[16]).

In all acute intra-abdominal inflammations there is marked tendeney for the omentum to beeome adherent resulting in a walling-off proeess. Owing to the rich blood and lymph supply, the omentum is an active agent in overeoming and loealizing such infeetious processes. As a final result we may find one of three eonditions: 1. Adhesions fixing the free border of the omentum and tending to produce torsion. 2. Chronie inflammatory ehanges in the arjaeent omentum, resulting in fatty and fibrous degeneration; eellular infiltration; thrombosis often with hemorrhage producing a mass or eyst, and also tending to torsion. 3. Thrombosis extending in the omental bloodvessels or an embolus earried from such a loeal inflammation to some remote vessel of the omentum resulting in eorculatory disturbanee, infarction and infiltration, or varieosities, hemorrhage, hematomata, or eysts.

Trauma from irritation or ligation of vessels at the free edge of the omentum is known to produee extensive ehanges in some eases. Freeman[19], in discussing omental transplantation advises; to avoid mass ligatures, to exeise as little as possible and that as near the free border as possible. He speaks of the possible after effeets and objeetions: 1. Loss of a strue-

ture which is possibly useful. 2. Lowered resistance to peritoneal infections. 3. Intra-abdominal adhesions of the stump. 4. Gastric or duodenal hemorrhage. 5. Focal necrosis in the liver. The last two conditions have been explained as due to emboli from thrombosed vessels at the border. Braune[20] reports five cases and states that such inflammatory masses usually follow laparotomy when portions of the omentum have been excised, or follow the reduction of an omental hernia when the mass was not recognized. One of Bloodgood's cases was an inflammatory mass in the stump of omentum which had been ligated three months previously at a hernia operation.

The symptoms are indefinite and not characteristic. There is history of longstanding abdominal distress, mild intestinal trouble, diarrhoea or constipation. Acute symptoms develop due to sudden change in the mass, circulator, disturbance or torsion. The tumor is often not palpable, but is superficial, having forced the intestines to the sides or covering them. Theoretically there should be a line of tympany between the mass and the liver, also below, but this is not constant.

Treatment is excision when possible though this may be extremely difficult on account of extenstive adhesions. Incision and drainage of the mass or excision of a wedge-shape piece is said to promote abdorption and cure.

To reconsider my case in the light of the findings and literature. While the gross and microscopic pictures strongly suggest the diagnosis of sarcoma, the various inflammatory and hemorrhagic infiltrations and degenerations can not be excluded. Furthermore true sarcoma is exceedingly rare, and I am unable to find any such case where recurrence did not promptly follow. It is difficult to explain the etiology of a degeneration in this case, since the mass was not adherent to any of the abdominal viscera, there was no torsion of the omentum, and there was no hernia. There was, however, definite evidence of previous inflammation in the appendix, and my only explanation is that an embolus from this region was carried and lodged in one of the omental vessels, producing thrombosis and a sub-acute inflammatory process in the dependant portion of the omentum.

Note.—A letter from this patient who is now in a distant city, describes what is undoubtedly an extensive recurrence. This fact establishes the diagnosis of primary sarcoma of the omentum beyond any reasonable doubt.

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DISCUSSION

DR. ARTHUR T. MANN, Minneapolis, Minn.: Sarcoma of the omentum is a rather rare bird, and if this is a sarcoma which the doctor has reported it is a very unusual tumor. Sarcoma is a reversion of connective tissue of the embryonic type, and it grows—no one knows quite why it grows, but it continues to grow. Inflammatory tissue is a reversion of connection tissue of the embryonic type, and sometimes these tumors are very difficult to differentiate. There are some spots, as I see them, in this jelly-like sarcoma, but a sarcoma has an abundant blood supply. The blood vessels are intimately connected with the delicate stroma in which the sarcoma cells lie which form the framework over it, and they consist of clefts and spaces with the endothelium of the most difficult type.

In looking over this specimen one is struck with the fact that the blood vessels show a complete wall. The vessels are too well organized to be the vessels of a usual sarcoma.

We have the omentum enlarged in tumor masses from a good many causes, less often than a good many other tissues. The acute inflammations would enlarge it, and show inflammatory tissue. This tumor lacks that characteristic. It does not have the characteristics of a sarcoma and that sort of thing which suggests an acute inflammatory process which is about it. There may be a chronic peritonitis, but the most common condition is tuberculosis. We get the thickening of the omentum; it becomes thicker and thicker and gets shorter and shorter as it grows until it is a more or less sausage-shaped mass across the abdomen above the umbilicus, and with a tympanitic space between the tumor and liver which is of great diagnostic importance.

We have the secondaries from cancers and rarely from sarcomas. There is a thickening also in connection with the very much debated malignancy of the tumor of the ovary, the intracystic papillary tumor of the ovary. In some of these papillary adenomas the tissue grows through the tumor and presents in little bunches on the surface, and some of these become detached and float around in the abdomen, so that they may be spotted all over the abdominal wall and on the peritoneum, and in some of these cases there are comparatively large masses in the omentum which can be felt. My feeling is that this is an inflammatory tumor, and not a sarcoma.

DR. H. E. ROBERTSON, Minneapolis: There is one consideration that I think we ought to remember in regard to the tumors of any connective tissue structure such as the omentum. All we have to do to classify ordinary tumors that occur in such a structure is to classify the tissues, and we have many more tissues than the omentum and greater possibility for tumors developing. There are many more tumors which occur in the omentum than are described in the literature. The fatty tissue gives rise to benign lipoma, to secondary sarcoma, osteoma or chondroma, as all connective tissue and endothelial lined lymph spaces may give rise to cysts or endothelioma or angioma of epithelial origin, and we have blood vessels which may give rise to blood angiomata. These are possibilities for primary tumors of the omentum. In addition to that, there is the extremely rare condition where bits of epithelial tissue are enclosed in the omentum from embryonic developmental times, and may give rise to epithelial tumors of the omentum, which are rare and remote, but a distinct possibility.

By looking at the lantern slides one cannot say whether this particular tumor is a sarcoma or inflammatory growth. When a man like Bloodgood has difficulty in differentiating from signs and slides a sarcoma from other tumors, far be it from me to differ from him.

DR. McDONALD (closing the discussion): I did not expect any one to make a real diagnosis from the slides shown on the screen. However, that is what we had to go by when the first slides were made without studying the literature. My first impression was a sarcoma when I got the sections, then as I got to thinking it over and looking into the literature of the subject, I came to the conclusion that sarcoma of the omentum, with a patient really recovering after a few months, was so rare as not to be thought of.

Dr. Bloodgood, who made a thorough study of the specimen and slides taken from various parts, made a statement in his letter that it looked more like sarcoma than anything he had studied. However, he said the differential diagnosis in inflammatory reactions in the connective tissue of the omentum was more difficult than in any other tissue in the body, and we know it may be very difficult in the simpler tissues. Therefore, his diagnosis of sarcoma was a tentative one on the ground that the patient had no recurrence.

There is a great deal in the literature on this subject; I found most of it in the French literature on inflammatory reactions and the causes. I had much more in my paper about tumors of the omentum than I was able to read in the fifteen minutes at my disposal. However, I think that the acute inflammations extending into the omentum will give an entirely different clinical picture from what we have here. For instance, there should be direct adhesions between such a mass and the primary inflammatory lesion. In this case there were not any adhesions of the omentum or any deficiency of any other structure.

Dr. Mann's point about the character of the blood vessels in the tumor will be confirmed by a study of the sections in detail.

Dr. Bloodgood in his remarks says that tuberculosis is not to be considered, as apparently the clinical picture is different.

In considering the causes of these inflammatory reactions we must think of them as being remote. Judging from a careful study of a number of cases and specimens, these tumors may occur as a result of injury to the free margin and apparent disturbance of the blood supply from ligation of the omentum.

Dr. Freeman in one of the issues of the Annals of Surgery in discussing resection of the omentum, speaks of the possible complications of thrombosis and extensive changes in the circulation. If a vein is thrombosed or occluded, we would expect to get a bunch of varicose veins with hemorrhage and the formation of hematomata. If it were an artery it would be an infarction with gradual infiltration. In my case I could not get the ordinary causes. For instance, there was no hernia in any portion of the omentum, and the omentum was not adherent. There had been no previous operation where the omentum had been interfered with. In casting about for a cause I was inclined to believe it came from a

thrombus which lodged in the omentum. That I think is the most probable explanation. Personally, I do not believe that it is a sarcoma, but it may be. I hope it is not.

WAR WOUNDS OF THE MAJOR JOINTS*

By Arthur Ayer Law, M. D.
Minneapolis, Minn.

Experience with war wounds of the major joints in the Spanish American war and the Philippine Insurrection, profoundly impressed the writer with the extreme gravity and high mortality from this type of battle easualty.

Similar observations were made by our American army surgeons in Cuba and the Philippines, who universally reported that invasion of the synovial eavities of the large joints by projectiles was followed by an appalling mortality, frequent amputation or ultimate ankylosis of the joints involved.

These eonclusions of our own army surgeons were later eonfirmed by the reports of British surgeons in the Boer war and by Japanese and Russian military surgeons in the Manehurian campaign.

The low power of resistance of the synovia to infection had long been aceepted and taught, and all surgeons in civil practice had a wholesome respeet for joints, and invaded the larger ones with an exceptionally eareful aseptic technique.

The published observations of Freneh, British and Belgian Allied surgeons from 1914 to 1916 added to the conviction of the extreme gravity of these wounds, for they reported a primary mortality of 27.6 per cent, amputation through the thigh in 30 per eent of the knee wounds, and a pathetically low percentage of ultimately mobile or useful joints.

Impressed with the gravity of these wounds, it was with interest that we studied them in Franee, first at the great French hospital center in Beauvais, where 16 evaeuation hospitals were stationed; then in the Ameriean evacuation hospital No. 104; and later in our own Base Hospital No. 26, in the vast hospital center at Alleray, Saone et Loire.

*Read before the Minnesota State Medical meeting, Oct. 1-3, 1919, Minneapolis, Minn.

Perhaps in no class of wounds has the ehange in treatment been so revolutionary when compared to our pre-war eoneeption of the proper surgery of the artieulations.

Late in 1917, Willems of Belgium and Delore of Lyons courageously broke away from the long accepted orthodox surgieal procedures and inaugurated a new treatment of joint wounds which accomplished almost miraculous results.

It was the reeognition by these surgeons of three fundamental underlying principles, whieh, applied to joint surgery made possible such exceptionally brilliant results. These were: first, early debridement and closure; second, recognition of the exeeptional resistanee of the synovia to infection; and third immediate and sustained free mobilization of the joint.

This treatment lowered the terrible mortality of 27.6 per eent to 0.9 per cent, reduced the percentage of thigh amputations from 30 per cent to 2. 8 per eent and gave an ultimately more or less movable joint in about 85.5 per eent of cases.

Debridement ehanged eompletely the results of war surgery. This operation coupled with primary suture, or, failing that, followed by the Carrell Dakin treatment or dichloramin T. and later by delayed primary or seeondary suture, enormously lessened the mortality, suffering and unhappy results of wounds: and what was as important, from the standpoint of military efficiency, it reduced the wastage of manpower by greatly shortening the period of eonvalesence, and permitted the more rapid return to their combat units of the 80 per cent of all the casualties whieh ultimately did return.

Allied surgeons recognized that all battle wounds showed contamination during the first eight or ten hours, but found that infection did not supervene until after this preliminary period and especially in wounds which had not been subjected to exeision.

Early debridement, therefore, aimed to remove all foreign bodies carrying baeteria and all traumatised, infected or devitalized tissues, leaving the wound sterile and the healthy tissues, by virtue of their unimpaired vitality and inherent resistance, in the best possible eondition for immediate repair.

When early exeision and primary suture were done the ideal of battle wound treatment was

reached; if debridement was late or followed infection, chemical disinfection was necessary, then when smears and cultures were negative the wound was closed by delayed primary or secondary suture.

In joint wounds then, debridement aimed to cut away all injured tissues, skin, capsule, synovial membrane, cartilege and bone adjacent to the tract of the missil, to remove lodged foreign bodies as well as bits of clothing or dirt and to leave the joint cavity clean.

Following this cleansing operation the synovia and capsule were closed and the skin sutured, unless the surgeon distrusted the wound, when he might leave a small capillary drain down to the parasynovial tissues, but never in the joint.

Probably many of the failures in the treatment of joint wounds in the earlier years of the war were caused by too late surgical relief and universal immobilization, for these cases were considered so serious they were evacuated directly to the base hospitals without operation at the front.

During the last two years of the war it was recognized that the best results were obtained by the earliest possible surgical intervention in the evacuation hospitals or autochirs near the front, the cases were held there as long as possible after operation.

Army surgeons had learned that the synovial membranes showed a more marked defensive reaction than most tissues; that they seemed even to possess a certain bactericidal power and long remained sterile. It was noted that while all of the wound, including the traumatized synovial edges, might be contaminated or infected, the synovial fluid remained sterile for as long as 60 hours before sepsis occurred.

Capitalizing this knowledge then; after the earliest possible debridement and complete closure of a joint the wound resolved itself into an aseptic injury of an articulation.

Given the knowledge of this definite interval when joint cavities combated infection and remained sterile, the wide open invasion of joints was possible, adequate explorations could be made while a great conservation of condyles, articular surfaces and bone fragments was attempted. It has been a surgical aphorism for years that a wounded joint must early be put at rest. When Willems advocated immediate and continuous mobilization of these joints, his radical suggestions were contrary to all precepts, yet when coupled with early debridement and closure of the capsule it was responsible for the remarkable advance made in arthritic surgery.

Willems insisted that active movements of the joints must be begun as soon as the soldier awakened from his anesthetic and that the movements must be active and complete. In the case of the knee and ankle, if the statics of the joint were not interfered with by too great a loss of articular surface, the man must walk by the second day and continue to walk through his convalesence.

These active movements, if started very early, were not painful, and the patients were taught to initiate and execute them as soon as they found how little discomfort they caused.

When a closed joint became distended with blood or fluid, its mobility was lost from distension and shortening of the capsule, yet when aspiration relieved the distension, mobility was immediately regained. Frequent aspiration, then, was indicated in distended joints.

Early in 1918 it was the custom of many French and American surgeons to flush open joints with either and to leave them filled with that fluid when they were sutured. This practice lost favor when we learned that the joints did fully as well when they were left clean and dry.

Fractures invading or within the joint, of course modified the treatment. In the knee, we learned that if half of a condyle or half of the articular plateau of the tibia was left after the toilet of the wound, a useful joint might still be expected; again, we learned that loose fragments of condyles or articular surfaces in the knee and elbow, after proper cleansing, and in sterile joints, could frequently be nailed or screwed back onto the shaft and would survive as literal autogenous transplants.

In one French evacuation hospital we were shown serial radiographs of a knee which had been conserved after the loss of three quarters of a condyle, and which showed at the end of a year the regeneration of most of the lost bone.

This joint had been saved by patient conservative treatment. These French surgeons verified their observations upon the human subject by experimental work upon dogs, this work being done during overcrowded months, within sound of the guns and while they were constantly subjected to night raids from enemy bombing planes.

The loss of bony contour in the elbow was not so serious as in the weight bearing joints, for this loss virtually resolves itself into a partial resection and a good functional result might be expected with little deformity beyond the loss of the carrying angle.

In the weight bearing joints, especially the knee, excessive loss of a condyle or of the tibial articular surface, invited a bowing or angular deviation from lack of bony support. Yet the temporary use of a Thomas splint hinged at the knee gave surprisingly good end results, for the muscles contracted, tending to overcome the deformity and hold the joint stable. The joint capsule and ligaments as well contracted and helped combat the tendency to angulation. If the crucial ligaments were intact and three quarters of the articular surfaces saved, a useful joint might be expected.

In the knee or ankle where there had been extensive loss of bone, or where fragments had been nailed in place, the soldier could obviously not walk but had to be treated with active mobilization in a hinged splint until the fracture united.

In joints where great fragmentation had occurred, the vulnerating missil had already practically done a resection and the surgeon simply completed it. Yet the attempt to conserve shattered joints give such good results that the method was generally tried before resection or amputation was resorted to. Where the popliteal vessels were lost an early amputation was imperative.

Surgeons have long recognized that distension of a joint shortens the capsule and resulted in grinding of the articular surfaces together. This coupled with immobilization invited the formation of synechia and ultimate ankylosis. Before the war we had learned to treat these joints by repeated aspirations and extension to combat this tendency; we had learned as well, that open drainage and immobilization of a septic joint tended to loss of function from ankylosis; therefore septic joints which must be drained to save life, were looked upon as lost joints.

After great battles with enormous casualties, where it was humanly impossible to early evacuate all the wounded, many of the joint wounds were septic before they came to the operating table. Following Willems suggestion, these septic joints were treated by wide open incisions, debridement, cleansing of the joint, removal of loose bone fragments and foreign bodies, and flushing of the joint cavity with ether or normal salt solution, after which the joint was left wide open and active immediate mobilization inaugurated. Here active movements were, if possible, more important than in the aseptic joints, for it is difficult to properly drain all the pockets of an immobile joint, whereas active motion mechanically empties them.

At first it hurt our surgical conscience to see pus spurting from the wide open wounds of a septic knee when the leg was actively flexed and extended, yet Willems treatment in these cases was life saving and gave the best assurance of mobile joints.

Where, heretofore, infection of a great joint often presented a picture of profound sepsis, with the advent of this treatment the great oedema and inflammatory reaction was absent while the soldier had none of the characteristics of serious infection.

With the wounds of joints there was frequently extensive involvement of muscles and other tissues, which called for suture, autoplasty or the sliding of pedicled flaps to repair loss of tissue, in addition to the treatment of the joint lesion itself.

When the patella had been extensively comminuted it was occasionally necessary to do a subperiosteal resection of that bone.

Perhaps the most serious type of articular wounds were those in which the joint was involved along with extensive comminution of the shaft of one of the long bones. These fractures were generally infected and in spite of the most radical treatment were the type responsible for the largest proportion of amputations and caused the greatest mortality.

Knee joint wounds complicating compound

comminuted fractures could sometimes be treated with active mobilization when the fracture itself was immobilized by ice tong extension and with the leg suspended in a Hogden or Thomas splint.

Wounds of the hip and shoulder joints, because of their anatomical construction and peculiar function, had to be more frequently resected than all the other joints combined.

With this great mass of material studied by so many observers from various angles during a period of four years "over there," it was inevitable that the study crystallize into the definite conclusions reached. If we will profit by these lessons learned in joint surgery during the great world war and apply them to civil operative proeedure, the surgery of articulations will find its standardization as firmly established as has the surgery of the abdomen, breast or inguinal canals.

DISCUSSION

DR. JOHN C. STALEY, St. Paul: It seems that the most striking feature of Dr. Law's paper relates to his statement of the great reduction during the course of the war if joint infections and the consequent lowering of mortality as a result of joint injuries. I think however that the statistics quoted are from the French and British rather than A. E. F. records. As the reports of work done in American Hospitals are completed and sent out the figures are not quite so good as those quoted. This difference in results is no doubt due to the conservative debridement of joint wounds by us during our early work in France. The French and British had learned well the lesson of early and radical debridement before we entered the war. At first their early treatment of these wounds was a swab of iodin and a bandage. The result following that line of treatment was so bad that Prof. Roux of Lausanne advised amputation or resection of all infected knee joints having any bone involvement. After it was found that early and thorough removal of injured tissue would prevent infections the French surgeons became radical and remained so. They were not satisfied with the simple removal from a wound of small pieces of loose bone but any bone which showed discoloration, indicating hemorrhage areas was chisled or gauged out. The American surgeons were not quite so radical but I believe they were coming to that.

Dr. David of Chicago has recently reported 55 cases of knee joint injuries treated in Base Hospital No. 13. Of the 55 cases 24 were infected or a percentage of about 44. I think the work done in that Hospital can be considered fairly typical of that done in the best A. E. F. hospitals.

We had yet to learn to be radical enough in the removing of injured bone at the primary operation and this fact no doubt will account for the differences in statistics which will appear later. I believe that emphasis should be placed upon the point that injured bone should be removed just as radically as injured soft parts. It is not so easy to do but if a wound is thoroughly explored all hemorrhagic bone which might harbor infection can be discovered and removed.

DR. HARRY ZIMMERMAN, St. Paul: As Dr. Law says, the tolerance of major joints to infection was a revelation to us all. The knee joint, which has always been a bete-noir to surgeons, apparently tolerates infection very well.

A small amount of infections is usually quite well taken care of, if infections are not associated with the presence of foreign bodies. All foreign materials behave as irritants and should be very carefully removed. The entire tract of the missile should be excised and this done in such a way as to leave no devitalized fragments of bone and, if possible, in such a way as to leave no dead space after the ultimate closure of the joint. The synovial membrane should be closed first, then the capsule of the joint with the lateral expansions of the quadriceps and other muscles that overlie it, as a second layer. If the skin has not been seriously injured, it is well to close that also and always with interrupted sutures sufficiently far apart to allow escape of serum. It is important to have proper hemotasis before the wound is closed.

It was our habit, at Evacuation Hospital No. 5, befor closing the joint, to wash it out with ether. Unless there is a definite joint deformity no effort is made at an immobilization. Dressings were applied and the patient encouraged to move the knee. It was remarkable that a great many of these joints got well without infection. The exact percentage of them I am unable to say but I should put it well over seventy per cent.

A great many cases were infected and a great many of these eventually became useful joints after following the treatment devised by Willems. Every Base Hospital received many cases of seriously infected joints wherein Willems treatment produced no good results and in which some radical procedure would have to be done in order to save the patient's life.

When we returned to the Base Hospital, there were several knee joints badly infected in which the Allis treatment was unsuccessful. These patients were profoundly septic and some died even after amputation.

The thing that is so distressing in knee joint infections is the peculiar extension of the joint cavity even after the joint has been freely opened. It was not unusual to find the cavity of the subfemoral bursa extending half way up the thigh beneath the quadriceps extensor muscle. Very often

the joint capsule extended posteriorally up the posterior surface of the femur for a great distance. Because of the fact that these joints had been opened, there was very little change from the normal contour. When one sees such a joint, except for the incision on either side of the patella discharging some pus, it does not give one the impression that it is irreparably diseased and, except for the profoundly septic condition of the patient, it seems a shame on first sight to amputate such a leg. We also found that the mere installation or irrigation of any antiseptic solution, even the more recent chlorine products, produce absolutely no good. The Willems treatment in this stage of the disease was impossible as the joints were so painful that they could not be moved and the patients were so septic that they had not the strength to move them and as for getting them out of bed, this was absolutely impossible.

There is room for a great deal of investigation in major joint surgery. Advances have been made but we still will see, even after the most careful application of the principals laid down in Dr. Law's paper, a great number of knee joints that will go on to amputation of death from sepsis. I am sure that these cases were our greatest trials at Base Hospital No. 26. A great many of these patients very soon developed metastatic foci so rapidly that even amputation was not waranted.

DR. F. A. DUNSMOOR, Minneapolis: I have been wondering what results we get when we are pushed into corners and have to fight. This is not really as new as it sounds from Dr. Law's paper, because it happens that, as old as I am, I can go back from memory when I was under Dr. Hamilton, who was then chief surgeon of the Army at the time of the Civil War. I was his pupil and walked the hospital wards in 1873 and 1874. Dr. Hamilton did not know as much about antiseptic work then as the men who have followed a long time since, but he did know this thing, that joint surgery, in the first place, had to be clean, and next the joint should be kept in motion where it is possible to do so. If you remember, he used very plain splints. The men who were associated with him advised the old Day splint, which is particularly useful in fractures in connection with the elbow joint, and the traction was to move this ratchet so as to straighten or flex the joint every day while the fracture was being treated.

The late lamented, Dr. Murphy, talked about these wounds which complicated joints, and he said plainly that those joints which were permanently drained were stiff joints, but those which were clean, no matter what operation was made, closed with good results and motion was kept up. Following the line of thought of men who are so widely apart as Dr. Hamilton, in time who had many, many long years of experience, and my observation of Dr. Murphy for only a short time, I have had the opportunity of seeing many of those principles carried out. When forced into such a calamity as the war Dr. Law has had the experience of association with great men, and this coupled with his own dexterity and ability and the government behind him, which was lavish in every particular, to do the work, he was forced into a corner, and with the Dakin and other solutions he was able to accomplish excellent results, and the lesson which is brought out at this time is to apply that which has been proven.

DR. CHARLES A. REED, Minneapolis: Dr. Law in his paper certainly brought out the good points in connection with the Willems treatment, but I am afraid some of us have not found it quite as simple to apply in these frankly purulent knees. The knees that came to us in the base hospital were mostly those that we closed at once, or had been cleaned out and were closed, and we had wonderfully good luck because those that got back to us, so far as I saw them personally, we were able to keep closed. They stayed closed by the mobile treatment and we got good motion. But in those which could not be closed, in which the destruction of the joint was so great that the surgeon who debrided them could not close them, it was another story. Almost all of them came back, as Dr. Zimmermann has said, when they were septic and some of them profoundly so. Any attempt to move these knees was almost out of the question; they were exquisitely painful. It may be that Dr. Willems was able to move them but we could not. We were up against it. The knee joint is a tremendously difficult structure to drain. The lateral ligaments fit the condyle so tightly that you can scarcely put the blade of a scalpel between; you cannot get down between the joints because the lateral ligaments hold the joint in close approximation, and the large pocket behind cannot be drained with the patients on the back. Of course, you would naturally say turn the patient on the face, but that is practically impossible because of the pain. There were a good many of these cases in which excision was resorted to; we also cut the lateral ligaments and put the knee up in an acute angle position with the joint wide open and the condyles and head of the tibia sticking out and in spite of that there were cases that had to be amputated, the moral of which is simply that the Willems treatment must be kept up from the first. You cannot have the lapse of two or three days and allow the patient to become profoundly septic and the knee frankly purulent and expect to get good results. We could not get them under such circumstances.

DR. LAW (closing the discussion): The statistics I have given were frankly taken from the British and French Service. Colonel Staley and myself were impressed with the extremely radical methods resorted to by the French surgeons. The American surgeons never felt it was necessary to be as radical as the French surgeons learned to be.

Both Dr. Reed and Dr. Zimmermann have spoken of not using this method of treatment in the late cases. I should have stated in my paper that this

treatment is to be initiated early. Dr. DePage, of LaPanne, Belgium, who has had a large experience with these cases, was privileged to serve in a section almost immediately behind the front line. Many of the evacuation hospitals were so situated that they could institute treatment immediately. Some of the evacuation hospitals, after the great drive in July a year ago, could initiate this treatment early. I want to emphasize the fact that this treatment must be instituted almost at once. I said "let them walk on these legs immediately they come out of the anesthetic. Some of the evacuation hospitals could not keep patients for ten days or two weeks, but they recognized the fact that if the principle of the greatest good to the greatest number was to be carried out, these joints must be immobilized in some splint. You see the object of it. When the joints were immobolized for two or three days, when that man gets back to us in the base hospital, his wounds were of such a nature as to preclude the possibility of giving him the Willems treatment properly. This ideal treatment has changed the mortality very materially and made it possible to give these men useful joints by early initiating this treatment in an evacuation hospital up close to the front.

I was very much interested in what Dr. Dunsmoor said about the Hamilton splint and its use in fractures of the elbow joint. Undoubtedly Dr. Hamilton got a good percentage of mobile elbows.

Dr. Zimmermann referred to distention of the capsule in shortening the capsule. Dr. Murphy brought this out years ago and said that distention of the capsule causes lateral enlargement of the capsule; that the capsule is only so long, and if you distend it laterally you shorten it longitudinally. He put on extension, and aspirated the joint to relieve distention because this distention shortened the capsule, and ground the articular surfaces of the condyles of the femur against the tibia, inviting adhesions and ankylosis.

I wish to thank the members for their discussions.

A MODIFIED INGUINAL HERNIA TECHNIQUE*

By George Earl, B. A., M. D., F. A. C. S.,
St. Paul, Minn.

What is the reason for recurrence of inguinal hernia after operation? Statistics on the question from army camps show such a wide variance that it is creating a new interest in the question of the technique of this operation. Surgeons like Bloodgood of Johns Hopkins and Torek of New York have written recently on the subject.

Comparative anatomy shows that inguinal hernia is more frequent in man than in the rest of the mammals taken as a whole. Williams of the Veterinary Department of Cornell University says regarding scrotal hernia in animals "Like unbilical herina it is uniformly congenital Gravity may aggravate either. It is due to an arrest in the development of the embryo by which the inguinal ring fails to narrow sufficiently to prevent intestine or omentum from slipping down alongside the spermatic cord. Physiologically, the inguinal ring remains open throughout life. Accordingly the hernia may vacillate, absent at one time, present at another, but the basic defect in the narrowing of the canal is permanent. So adult males supposedly free from hernia occasionally die from strangulated hernia following copulation." In the pig, scrotal hernia is common, and veterinarians tell us that the ring is very short and direct and that a rather simple castration cures almost without recurrence. Scrotal hernia is not unusual in the stallion and also in the ram. These species are rather the exceptions that prove the general rule of infrequent inguinal hernia in mammals on all fours. They are more prone to umbilical and ventral protrusions, because these portions are more dependent and also more liable to injury.

Erdman says, "It is not without meaning that the child first creeps and assumes the upright position only with a great deal of effort." With the erect posture the oblique or horizontal line of the inguinal ring is transformed into a vertical one. Standing tends towards a visceroptosis, placing an unnatural strain on the

*Presented before the Southern Minnesota Medical Association, December, 1919, Mankato.

Fig 1
Incision thru skin exposing external oblique

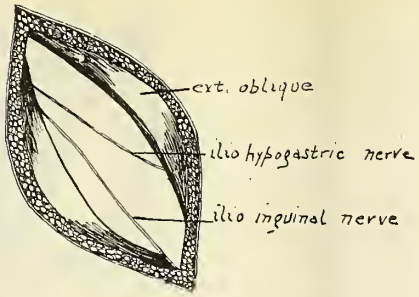

Fig 2.
Nerves to be located and avoided

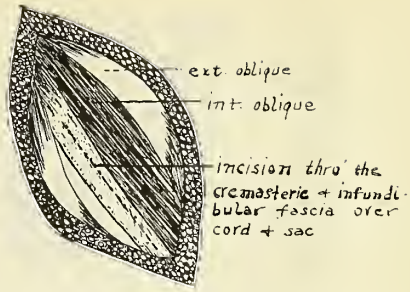

Fig 3
Incision thru the cremasteric and infundibular fascia over cord and sac.

attachments of the abdominal organs. Without a visceroptosis the presence of an open inguinal ring might have no ill effect, as normally the mesentery should hold the bowel either large or small and also the omentum away from the canal. Visceroptosis, however, is always present and sometimes to a marked degree and together with the strain of gravity, the intra-abdominal pressure, and the action of all the abdominal muscles, give one a direct reason for hernia. It is interesting to note that it is practically only the mammals that have the diaphragm. The birds are free from the force of this powerful muscle there thus being greater room for play and distribution of force and less direct strain.

The general action of the muscles of the inguinal region is a backward and upward pull. These muscles have a purchase in Poupart's ligament and the pubic bone. It would seem reasonable that the action of the muscles and fascia should be preserved as far as possible. This means that the fascial attachments, especially their insertion in the pubic bone and Poupart's ligament, should be disturbed as little as possible; also that if they are altered there should be as complete a restoration as possible. If the fibers of the internal oblique cannot easily and securely be approximated to Poupart's ligament and if we have a weakened conjoined tendon, the device has been used of severing the rectus by cutting above or below and pulling that down to fill the void. There is no doubt that the muscle tissue is of prime importance. In suturing a perineum, which is quite an analogy, we aim by all means to secure muscle tissue for approximation; so it has become a recognized principle that in inguinal hernia, we should aim to build our closure on the internal oblique, the conjoined tendon, and the rectus muscle.

In the perineal operation we also aim to secure accurate and complete fascial approximation, so too, in the hernial operation it has become recognized that the fascial covering is of importance. There are those who advocate transplanting a portion of the fascia lata in certain types or putting a portion of the external oblique under the cord and directly suturing to the internal oblique. No doubt many at times have placed the entire external oblique underneath the cord, suturing first the lateral portion to the internal oblique and then covering the whole with the mesial flap, giving, in addition to a firm muscular closure, a strong fascial reinforcement. I have been unable to find as yet any one who has advocated this technique as a routine. I feel that by placing the entire external oblique underneath the cord and quite forgetting the cord in the suture of the muscles, one can devote the entire material to a proper closure of the lower portion of the inguinal canal. If the external oblique is to be used to cover the cord or a portion of it, one must consider the formation of an external ring and consequently may neglect to fully emphasize the importance of a complete repair of

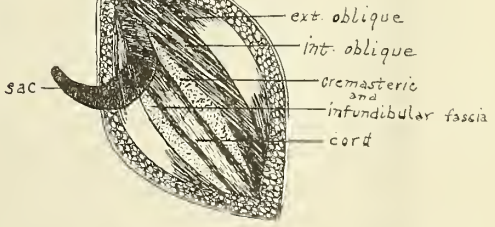

Fig 4.
Separation of sac from cord

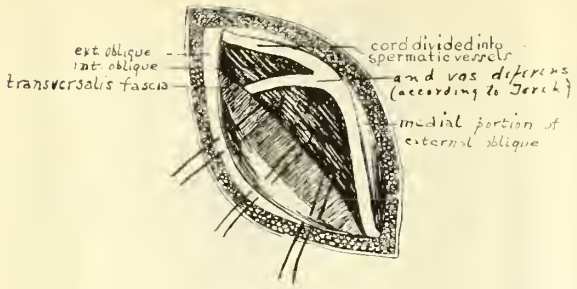
ext oblique
int oblique
transversalis fascia
cord divided into spermatic vessels and vas deferens (according to Torek)
medial portion of external oblique

Fig 5
Stitches bringing the internal oblique to Poupart's ligament

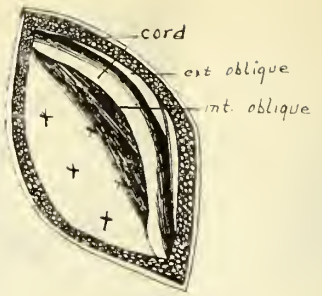

Fig 6
Suturing of external oblique to internal oblique

this weakest portion of the abdominal wall, i.e., the lower portion of the inguinal canal, the triangle bounded by Poupart's ligament, the pubic bone, and the musculature of the rectus and internal oblique.

If the sac is properly dissected from the cord and blood vessels, there is very seldom a recurrence in the region of the internal ring, and if there is a recurrence it is usually small and practically never gives any symptoms. Torek's technique at the internal ring of separating the vessels and the sac and keeping them apart, is undoubtedly a real advance, and if properly executed handles the indirect hernia satisfactorily. The region of the external ring, however, brings up the question of a direct hernia and it is this hernia that is often over-looked, the more so because we often have to deal with indirect inguinal hernia and direct inguinal hernia at the same time, two distinct abdominal weaknesses.

In a direct hernia, if we do not transplant the cord, we have left a weakness of the abdominal wall, smaller in size, but at exactly the same place. Ferguson's operation has done an immense amount of harm because it has influenced many to follow a technique of not transplanting. Bloodgood** says, "When I first transplanted the rectus in order to suture it to Poupart's ligament and thus strengthen the defect in the lower angle of the wound due to the obliteration of the conjoined tendon, I also transplanted the cord and excised the veins as in the Halsted operation. Since my publication in 1899, we discontinued to transplant the cord and rarely excised the veins, and when this rarer type of inguinal hernia presented itself, we continued the method of transplantation of the rectus, usually with Halsted's modification of transplanting its sheath, but we did not transplant the cord. As far as I am able to ascertain, in the group in which I had transplanted the cord, there has been only one recurrence, but since the change in technique of leaving the cord undisturbed in the lower angle of the wound, I know of at least four recurrences in operations which I performed myself, and it seems strange that this made no impression." Torek** says, "Below the vas suturing of Poupart's ligament to the internal oblique and transversus muscles and often to the rectus muscle is continued all the way down to the insertion of the pubis. This is of importance in order to avoid recurrence in the shape of direct hernia, as well as for the repair of one already existing."

I have never found any functional or anatomical objections to placing the cord completely over the external oblique. This modified technique covers the cord only by the superficial fascia and skin from its exit at the region of the internal ring, but it is covered by nothing else as it goes over the pubic bone, a far more exposed region. There is less liability for strangulation of the cord, than where a new external ring is to be formed from the external oblique.

I have only had an opportunity to test this routinely in a series of forty-two cases. In ten a double operation was performed. This was over a period of two years and while we have endeavored to follow up the cases, perhaps an insufficient time has elapsed. Yet the fact remains, as evidenced from the army camp experiences, that in the great majority of cases if there is to be a recurrence, it comes very soon.

**Annals of Surgery, Vol. 70, No. 1, July, 1919.

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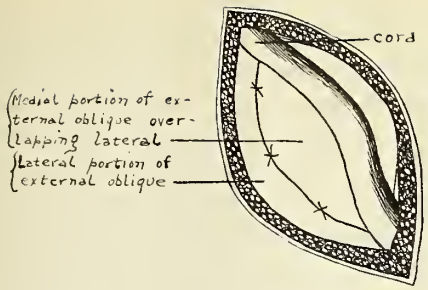

Fig. 7
Overlapping of external oblique

We have had reports from thirty-eight of the cases operated and none of them have complained of pain from the lessened covering, and in those who have reported there have been no recurrences. This senses immediately the justifiable criticism of any routine operation and that each individual case is a law unto-itself. An effort has been made simply to establish any functional or anatomical objections to using this modification in the majority of cases. I purposely avoided the discussion of suture material and different methods of placing the stitches, because, undoubtedly, this is all secondary to such considerations as tension. Many advocate at least one unabsorbable suture in the lower angle if there is evidence of strain. The necessity of avoiding injury to the nerves of this region is mentioned in all descriptions of the operation. The accompanying slides demonstrate the technique employed.

Fig 8
Suturing pad of fat and fascia over the cord.

SURGICAL SHOCK*

By Samuel C. Plummer, M. D.
Chicago, Ill.

Surgical Shock is a subject of great interest to everyone who does surgery. Those who do traumatic surgery often have their patients come to them in a condition of surgical shock, while those who do not do traumatic surgery still have to consider the matter of surgical shock as a result of operation.

During the last fifteen years or more many physiologists have done a great deal of experimental work trying to ascertain the real cause of shock. It is desirable that this be learned if possible because any course of treatment of any condition rests upon a much surer foundation if the actual cause of the condition is known. It is true that we have worked out from clinical observations a rather satisfactory treatment of shock without knowing the actual cause just as we learned from clinical experience that quinine was beneficial in malaria and mercury in syphilis long before the plasmodium of malaria or the spirochete of syphilis was discovered. However, the treatment of both these latter conditions was improved with the discovery of the cause and no doubt improvement in the treatment of shock would result from the discovery of its cause.

Arriving at the ultimate truth in matters involving the complicated physiology and physiological chemistry of the human organism is extremely difficult and when some investigator, as a result of long and careful experiments and observations, thinks he has solved the problem it is only a matter of a few years until some other equally careful investigator shows the imperfections of these investigations, throws doubt upon the conclusions and advances a new theory which looks perhaps more promising than the one just overthrown. For instance, when Crile showed us the changed condition of the cells of the central nervous system in an animal which had been subjected to shock and concluded that the essential cause of shock was exhaustion of the vaso-motor cen-

*Read at the semi-annual session of the Sioux Valley Medical Association, Sioux City, Iowa, January 21-22, 1920.

ter, we were all inclined to rest baek serenely with the feeling that at last we knew the cause of shock and, since it was due to dilation of the vessels on aeeount of the lowered tone of the vasomotor eenter, the treatment consisted in toning up this eenter whieh would result in a vaso-motor eontraetion and raise the blood pressure. Among the new remedies at that time adrenalin was the favorite. Experienee taught, however, that the effeets of adrenalin were transitory and that while it was not without some effect it could not be relied upon to the extent whieh we had hoped. As to having arrived at the true eause of shock, after a eertain period of complaeency on our part, Seelig, Porter and many others apparently proved that the vaso-motor center, instead of being exhausted in shock, held out until almost the last and gave way only when all other forces were exhausted. I do not believe any surgeon at the present time claims to know the cause of shock. Among the hypotheses as to the cause of shock Doctor Porter enumerates the following: "(1) the exhaustion of the vasomotor center, (2) the excitation of sensory nerves, (3) a hydrostatie fall in blood pressure, (4) vibration injuries, (5) direct wounds of the vasomotor apparatus, (6) hemorrhage." In addition to these, acidosis and a deficieney in $C'O_2$ were put forward as causes.

When the World War broke out, strong hopes were expressed that the vast amount of clinical material which would be available would afford a basis for studies in the physiology and clinical manifestations of shock which would result in a definite settlement of the nature of shock and its treatment. Of the conditions to which had been attributed the eause of shock we knew that some of these were not causes but merely phenomena of the condition.

As a matter of fact a great many clinieal observations were made during the war by the ablest of physiologists and clinicians. The physiologists also did a vast amount of experimental work. The British Government appointed a commission to make a speeial study of this condition and a number of Ameriean medical men were included in this commission.

Two new theories as to the cause of shoek were brought forward by American physiologists, Doctor Porter and Doctor Cannon. Porter's theory was that shoek was due to fat embolism in the medulla which lessened the actively of the vaso-motor center. He elaimed that shoek appeared oftenest in wounds where large amount of subeutaneous or abdominal fat was traumatized or in eompound fractures of the large bones, espeeially the femur, where injury to the medullary cavity oeeurred. Cannon's theory was that shoek was due to the absorption into the system of toxie proteins from the traumatized tissues and made experiments in which injury was done to a limb whose eireulation was eut off by an elastic constrictor claiming that as long as the constrietor remained on, the phenomena of shock did not appear but did appear when the constrictor was removed, thus allowing the proteins from the tissues to get into the general circulation. Neither of these theories have been generally aeeepted and it is the general opinion that the eause of shoek is still undetermined in spite of the skillful efforts made from the material furnished by the war to discover it.

I shall not go into the symptomatology of shoek as the picture is so well known. It is agreed by all that the essential phenomenon of shock is an abnormally low blood pressure.

As to treatment, for many years it has been agreed that the essentials of treatment consisted of rest, as nearly absolute as possible, relief from pain, the application of heat to the body, the elevation of the feet to a higher level than the head and the administration of hot liquids, these liquids to be given by mouth, when this was possible, otherwise by reetal injections or by intravenous injections; subcutaneous injections are also efficient if the degree of shock is not too great but if the blood pressure is too low absorption from the subcutaneous tissues fails to take place.

The first essential in treatment above mentioned, namely rest, naturally preeludes the performanee of any operation exeept those of the mildest degree of severity until the patient has reaeted from shoek. In 1908, I wrote an article on the advisability of operating during shock. In preparing this article I referred to a large number of standard text-books on surgery, consulting Ameriean, English, Freneh and German publications. I found that they

were unanimously against the practice of operating during shock. There was not one exception to this. I also noticed that, while works published in the decade from 1880 to 1890 devoted considerable space to the discussion of this subject, the later text-books treated it very briefly and I feel that this matter of deferring operation until the patient has reacted from shock is not sufficiently dwelt upon. The surgeons of the last century had evolved from clinical experience certain fundamental principles in the treatment of shock.

What have we learned from the experience of the Great War to add to the treatment of shock as laid down above? Porter acting upon his theory that the essential cause of shock was fat embolism and noting also that, if the patient was given carbonic acid gas by inhalation, this caused much more active movements of respiration thereby increasing the pumping action of the diaphragm and accelerating the circulation from abdomen to the chest, advocated this treatment of inhalation of carbonic acid gas and found that the blood pressure increased under this treatment. The inhalation of carbonic acid gas in shock was not new as it had been used before by Henderson, actuated however, by a different theory, namely; that there was a deficiency of C O_2 in the blood and that the addition of this by inhalation caused increased respiratory efforts. The practice of this inhalation of C O_2 however, did not become very general and while it may be useful in some cases, especially in those in which fat embolism actually is present it is doubtful whether it adds a great deal to the means of treating shock.

A phenomenon of shock, which may be one of the essential causes of the condition or only a result of the condition, which was frequently noted during the war was the fact that the volume of blood in the vessels was reduced. This is accounted for in various ways. Of course, if there has been hemorrhage the amount of blood in the vessels has been reduced from that cause. Other theories are that the plasma of the blood has passed out of the blood vessels into the tissues, that the blood has stagnated in the dilated capillaries or that the large blood vessels in the abdominal cavity have dilated so as to cause the collection of a large proportion of the circulating blood in the abdominal cavity. Whatever the cause may be, it seems to be agreed that there is an actual reduction of the volume of blood in the general circulation and, in view of this fact, naturally means have been devised to make up for this reduction. To this end the patient must be given liquids. As stated above these are given by mouth, if possible, and should be given hot. It was found that hot liquid nourishment to patients who were able to swallow and retain it was of great value. In urgent cases, however, it was necessary to inject liquids into the veins. It was found that the intravenous injection of normal saline would raise the blood pressure but that the effect was transitory, because the normal saline quickly escaped through the walls of the vessels. In order to supply liquid which would not escape so easily solutions of acacia were advocated, six per cent of gum acacia being used. This fluid had a greater viscosity than the saline and, consequently, did not escape from the vessels so rapidly. This acacia solution was used in many cases and was praised by many but also condemned by many who thought it did more harm than good. In order to get the benefit of the increased viscosity of the acacia solution and at the same time overcome its harmful effects, Erlanger and Gasser advocate the slow and simultaneous intravenous injection of the acacia solution and a hypertonic glucose solution on the ground that the hypertonic glucose solution rapidly attracts water into the blood vessels. On the theory that acidosis is either the cause of shock or one of the important manifestations of shock to be combated the intravenous injection of alkaline solutions has been advocated.

The best of all intravenous injections is undoubtedly human blood. The technical difficulties of transfusion were largely done away with by the introduction of the citrated blood method of transfusion. The precaution must always be taken of typing the blood, that is, testing the blood of the donor and of the patient to make sure there is no incompatibility between them.

We were somewhat familiar with the value of observing the blood pressure in shock, but Porter emphasized the desirability of frequent readings of the blood pressure as an index to

the condition of the patient. In his paper on "Traumatic Shock" published in the "Boston Medical and Surgical Journal" May 16th, 1918, he speaks of what he calls the "Critical Level" of blood pressure. By this Critical Level he means the point below which the blood pressure will not usually rise again without assistance and places this level at about sixty (60) mm. taking the diastolic pressure with a Vasquez instrument. I quote the following:

"An understanding of the critical level is of the first importance in the study and treatment of shock. If the blood pressure just touches the critical level, a difference of ten millimeters of mercury may be the difference between life and death. A few millimeters above this level, recovery will usually occur spontaneously; a few millimeters below, death will follow unless skilled aid be at hand. It follows from this vital fact: (1) that procedures which at ordinary blood pressures are not harmful, or are but slightly harmful, may kill the patient at the critical level; (2) remedies that raise the blood pressure but ten or fifteen millimeters will save the patient when this rise carries the blood pressure from just below to just above the critical level."

Before proceeding to any operation in a patient suffering from shock we must therefore estimate whether the added shock of the operation will be sufficient to reduce the blood pressure to the critical level. If the operation cannot be done without so great a reduction of the blood pressure it is unsafe to proceed until still further reaction from the shock. In forming a judgment as to the safety of an operation it must not be forgotten that the anaesthetic of itself is a cause of shock and this factor must be added to the amount of operative shock expected.

There is but one exception unanimously agreed upon to the dictum that no operation must be performed until the patient has reacted from shock and this one exception is the presence of hemorrhage which cannot be controlled except by operation. If the danger of death from hemorrhage is greater than the danger of death from the shock of the operation the danger of shock must be risked in order to control the hemorrhage.

Doctor Porter did not confine his treatment of shock to giving inhalations of carbonic acid gas but he added to this the measures which are so well grounded in the treatment of shock, namely; rest, heat and elevation of the lower extremeties. He did not even allow the shocked patients to be washed or their clothing disturbed, so that it is difficult to tell how much of the improvement was due to the carbonic acid gas inhalation and how much the standard treatment of shock which he carried out.

An important measure in the prevention of shock, especially if the patient must be transported, is the immobilization of fractures and this was something that was thoroughly developed by the medical departments of the allied armies. Splints were supplied in large numbers at the front and applied at the earliest possible opportunity, so that patients were transported with comfort and avoidance of added shock from this source.

In summing up, I would say that the cause of shock is still unknown, that there is nothing absolutely new in the treatment, but that the measures to bring about an increase in the volume of circulating blood deserves more consideration than they previously received, that the frequent testing of the blood pressure as a means to ascertaining whether the patient is in condition for operation should be more generally used and that the dictum of our forefathers that a patient should not be operated upon until he had reacted from shock has been borne out by the vast experience of the World War.

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Vol. III July, 1920 No. 7

EDITORIAL

AMERICAN ROENTGEN SOCIETY MEETING

We are fortunate in having the twenty-first annual meeting of this national society in our state this year. Roentgenology has made such rapid strides during the past decade and promises to increase in importance not only as a diagnostic but as a therapeutic agent that we are all interested in its progress..

This year the meeting is to convene for a day, September 14th at the Mayo Clinic on invitation of Dr. William J. Mayo, where the Clinic will concentrate on cases of particular interest to roentgenologists and physicians interested in radium. It is anticipated that the variety of uses of the unknown rays will be shown in skin, jaw and face cases and in urological work and in addition in demonstrations by the Pathological and Orthopedic Departments.

Special arrangements will minimize transportation difficulties as Pullmans will be sidetracked for the day and luggage may be left in situ until the special train leaves at about 3:30 in the afternoon for Minneapolis. The visitor will select the clinic or demonstration in which he is specially interested were he will spend the morning and after luncheon he may attend a general meeting..

The following three days, September 15, 16 and 17 will be spent in Minneapolis. One special feature coming near the close of the meeting will be the Caldwell lecture, each year to be given by some speaker of national or international reputation. Dr. Walter C. Alvarez, Instructor in Research Medicine in the George Williams Hooper Foundation for Medical Research at the University of California, will speak on Gastrointestinal Peristalsis. Dr. Alvarez is well known to many of our readers and his presentation of the physiologist's view of gastrointestinal motor physiology will be intensely interesting to every internist as well as roentgenologist.

The scientific exhibit is in charge of Dr. Frank S. Bissell, Dr. C. A. Donaldson and Dr. R. R. Knight, all of Minneapolis. It is desired that all who wish to present an exhibit notify the committee in advance so that ample provisions may be made. It is hoped that an extensive exhibit may be shown at this meeting.

IS SMALLPOX CONTROL VANISHING?

A review of the public health reports issued by the Treasury Department shows a marked prevalence of smallpox pretty generally scattered all over the United States. In view of the fact that an increase of smallpox has followed almost every war in which this country has been engaged, consideration of the presence of this disease is timely.

Toronto experienced a large epidemic of smallpox during the past winter. Detroit shows an unusual number of cases at the present time. The same condition is present in Minnesota. Particularly in Minneapolis are many cases of the disease reported continuously. California is experiencing the same condition. Very fortunately for all concerned the disease is mild and the death rate from it is practically negligible. Careful analysis of the cases in all places mentioned shows that over 95 per cent of the infections occurred among those who had never been previously vaccinated. A very small fraction occurred among those whose vaccination was very old. Almost no cases occurred among those who had been recently successfully vaccinated, and in this group it is very reasonable to doubt whether or not the diagnosis of smallpox was justified.

Prior to Jenner's discovery of the value of

cowpox vaccination the world contributed millions of lives to this disease. During the nineteenth century the results of the discovery contributed markedly to the control of what was then a most serious disease. It is now rare to find a person marked by smallpox. Formerly one without pox marks was a curiosity.

Is history about to repeat itself? Has our carelessness and contempt, bred of familiarity and the mildness of the infection, resulted in undoing the great work accomplished during the previous century? Is it possible that by letting up on our vaccination requirements for school children and others that we are rearing a new generation of susceptibles who, when their numbers become sufficient, will supply a fertile field in which smallpox again can play wholesale havoc?

Very few of the cases which occur among the reports are among the foreign born. Presumably the strict vaccination laws in European countries are responsible for this. It is frequent to meet group histories where every member of the family has had mild smallpox except the oldest son who was successfully vaccinated in the army. The roving colored adult male is showing eight times as much smallpox in proportion to his numbers as the Caucasian. Vaccination among the Negro is rare unless he has been in army service, railroad service or other employment where strict insistence is placed on this procedure.

It is easy to put off vaccination. It requires continuous effort and teaching to secure vaccination of a large proportion of the population when no compulsory vaccination laws are in effect. We should rigidly insist on vaccination for all children admitted to any public or private school. We should continue our efforts to instruct the people in this regard at all times. We should not wait for an epidemic of malignant smallpox to stimulate us to do this. We cannot fold our hands in utter complacency and leave the entire job of teaching the people to city and state board of health, to voluntary health agencies or to health columns in newspapers. Each physician is potentially a health officer. Each physician should accept a certain degree of responsibility in the matter of instructing the family with whom he comes in contact. By concerted action of all the physicians in the state constantly advertising vaccination of the young children in all the families with whom they come in contact, we will accomplish much to rid the state of the constant presence and occasional epidemic of this disease in mild form and protect the citizens against the ravages of it in malignant form.

C. E. S.

MEDICAL SUPERVISION OF SCHOOLS

The increasing emphasis which has been put on the value of preventive medicine has very properly been expressed in the development of medical supervision in the schools. Throughout the country efforts are being made more and more to control contagious diseases in the schools where conditions are so favorable for their spread, to prevent the disgraceful sacrifice of children's teeth and further increase the nutrition of the youngsters by means of nutritional clinics and out-of-door classes.

The appalling percentage of physical and mental defectives in the young men of the country, disclosed by the recent army draft has only further emphasized the need for preventive measures. While the medical profession is opposed to socializing medicine to the abolition of private practice, we always have been and always shall be in favor of social measures to prevent the development of disease, unbusinesslike as it may seem.

It would be a mistake for a state, county or municipality to allow the H.C.L. to reduce its appropriations for this line of activity. The State Board of Health is being forced to curtail its activities to the detriment of the health of the state because a dollar today goes only as far as fifty cents yesterday and we fear will look like thirty cents tomorrow. With the change in municipal officials, such as has just taken place in St. Paul, will come the necessity for properly apportioning the funds which will be insufficient to meet all demands. During the previous regime the one school physician was given two assistant physicians and two dentists and the force of school nurses was increased from ten to twenty. Will a backward step be necessary and a false economy be instituted to the detriment of the public health. The activities of this particular department

should be increased and parochial schools should receive some assistance.

The steps taken in New York and Chicago for making diphtheria vaccination available to school children is another preventive measure which should be instituted in the city schools of the state. Diphtheria toxin-antitoxin vaccination is no longer in the experimental stage and universal use promises to strike off one more serious disease from the long list affecting humanity. This so-called "diphtheria T. A." is used and recommended by the New York and Chicago Health Departments for the universal vaccination of children. With the approval of our state and city health authorities and the sanction of the school medical supervisors opposition can be expected only from that ever present few, of bizzare mental make up, who delight in being different and opposing any measure, new or old.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

RED RIVER VALLEY MEDICAL SOCIETY

The midsummer meeting of the Red River Valley Medical Society will be held at Warren, Minn. July 8th, 1920. A full days program of general interest is being arranged for. There will be morning and afternoon sessions. Preceding the morning session operative and bedside clinics will be given at the Warren Hospital. The regular society banquet will be held at the Hotel Warren at noon. Physicians are urged to bring their ladies for whom suitable entertainment will be provided. Those desiring to attend the meeting are requested to notify the secretary Dr. H. M. Blegen, Warren, Minn.

BLUE EARTH VALLEY MEDICAL SOCIETY

The semi-annual meeting of the Blue Earth Valley Medical Society was held May 27, 1920 in Fairmont, Minn. The following are the officers: President, Dr. J. A. Broberg; Vice-President, Dr. R. C. Farrish; Secretary, Dr. R. C. Hunt; Trustees, Drs. A. Gullixson, W. J. Richardson and F. N. Hunt.

MINNESOTA PUBLIC HEALTH ASSOCIATION COLUMN

By Dr. H. W. Hill, Exec. Sec. M. P. H. A. Shubert Building, St. Paul, Minn.

"MAKING FRIENDS WITH THE PUBLIC"

SUGGESTION NO. 2

Medical men as individuals are citizens of high standing; but "medicals in bulk" are too often looked upon as untrustable cranks, grouches, faddists, impracticable dreamers, or profiteering trust members, ironclad and domineering.

These futilely absurd notions are based on lack of understanding by the public from which misunderstanding a previous article under this caption suggests at least one way of escape.

It would appear however, that "medicals in bulk" can never achieve the status of the medical man as an individual unless "medicals in bulk" visualize themselves in bulk to the public, as rendering service in bulk.

It is on the service basis that the medical man as an individual has achieved his often enviable, sometimes unique, influence upon his associates. It is on the service basis that the Rotary Clubs and Commercial Clubs have presented favorable the business man in bulk. It is on the service basis that the "medical man in bulk"— the Medical Society, to be as concrete as we may—must reach the same enviable standing.

Now in what sort of srvice? The public have considered, more or less blindly, and have decided more or less absurdly (as it seems to us) that services in public health are not appreciated when coming from the medical man in bulk.

The reasons for this state of public mind is perhaps guessable, but we may at the moment neglect these reasons, since the fact itself is so clear: so very clear is it that medical men in bulk have begun openly to withdraw from Public Health endeavors, particularly legislative; openly and avowedly for the reason that their motives are misunderstood; and that their support of public health measures is, for that reason, not unfrequently a detriment rather than an aid. Our belief is that the public service which a medical society can give—each city society in its own city, each county society in its own county, each district society in its own district—should take the form of the *Periodic Examination Clinc.* No treatment; diagnosis and advice alone, the latter chiefly concerning the advisability or otherwise of treatment—and such work offered free as to service only, under the auspices of the Medical Society, say once a month in suitable localities, the expenses to be borne by county agencies—the Minnesota Public Health Association local branches (County Public Health Associations) for example. These expenses will be but small—the results should be extremely

valuable, if only in inculcating the desirablity of annual examinations for all concerned.

To combine suggestions No. 1 and No. 2, let every County Medical Society willing to try this out arrange a combined meeting with the public (the local County Public Health Association will gladly assume the advertising to the public of this event).

Then let the proposition be discussed of Periodic Examinations, of their value particularly in heart disease, cancer and tuberculosis, as well as in hundreds of minor affections: and see if some concrete plan locally applicable cannot be worked out.

Any County Medical Society can write to our Headquarters at the Shubert Building, St. Paul, and be placed fully in touch with the County Public Health Association or supplied with related information.

NEW AND NON-OFFICIAL REMEDIES

During May the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Dietetic Cellulose Co.:

Celluflour

Intra Products Co.:

Ven-Iron Cacodylate

Ven-Iron Cacodylate with Sodium Chloride.

Barbital-Chiris.—A brand of barbital (see New and Nonofficial Remedies, 1920, p. 82) complying with the N. N. R. standards. Antoine Chiris Co., New York.

Barbital Sodium-Chiris.—A brand of barbital sodium (see New and Nonofficial Remedies, 1920, p. 83) complying with the N. N. R. standards. Antoine Chiris Co., New York.

Condensed Vitalate.—A pure culture of **Bacillus bulgaricus.** It is designed for internal administration (see general article, Lactic Acid-Producing Organisms and Preparations, New and Nonofficial Remedies, 1920, p. 156). The preparation is distributed by the manufacturer only. Vitalate Laboratories of California. Pasadena, Calif. (Jour. A. M. A., April 3, 1920, p. 951).

Elixir Barbital Sodium-Abbott.—Each fluidounce contains barbital sodium-Abbott (see New and Nonofficial Remedies, 1920, p. 84), 20 grains. Abbott Laboratories, Chicago.

Aromatic Chlorazene Powder.—A powder composed of Chlorazene (see New and Nonofficial Remedies, 1920, p. 137), 5 per cent; sodium bicarbonate, 5 per cent; eucalyptol, 2 per cent; saccharin, 1 per cent; and sodium chloride, 87 per cent. Abbott Laboratories, Chicago.

Capsules Corpora Lutea Desiccated-Hollister-Wilson 2 grains.—Each capsule contains desiccated corpus luteum-Hollister-Wilson (see New and Nonofficial Remedies, 1920, p. 204), 2 grains.

Capsules Corpora Lutea Desiccated-Hollister-Wilson 5 grains.—Each capsule contains desiccated corpus luteum-Hollister-Wilson (see New and Nonofficial Remedies, 1920, p. 204), 5 grains.

Tablets Corpus Luteum Desiccated-Hollister-Wilson 2 grains.—Each tablet contains desiccated corpus luteum-Hollister-Wilson (see New and Nonofficial Remedies, 1920, p. 204), 2 grains.

Tablets Corpus Luteum Desiccated-Hollister-Wilson 5 grains.—Each tablet contains desiccated corpus luteum-Hollister-Wilson (see New and Nonofficial Remedies, 1920, p. 204), 5 grains. The Hollister-Wilson Laboratories, Chicago.

Schick Test-Gilliland.—Marketed in packages containing a capillary tube of diphtheria toxin (standardized) and a vial of diluent, and in packages containing four tubes of diphtheria toxin and four vials of diluent. See Diphtheria Immunity Test (Schick Test), New and Nonofficial Remedies, 1920, p. 304. Gilliland Laboratories, Ambler, Pa.

Corpora Lutea Soluble Extract-Hollister-Wilson.—A sterile solution of those constituents of corpus luteum which are soluble in physiological solution of sodium chloride, containing in each Cc. 0.02 Gm. of soluble matter in addition to sodium chloride and chlorbutanol (as a preservative). For a discussion of actions and uses, see general article on Ovary, New and Nonofficial Remedies, 1920, p. 201. It is marketed in the form of Ampoules Corpora Lutea Soluble Extract-Hollister-Wilson 1 Cc., Hollister-Wilson Laboratories, Chicago.

Eucatropine. — Euphthalmine. Phenyl-Glycolyl-Methyl-Vinyl-Diacetonalkamine Hydrochloride. Eucatropine was first introduced as Euphthalmine. It produces prompt mydriasis, free from anesthetic action, pain, corneal irritation, or increase in intraocular tension. The effect on accommodation is slight and transient. Eucatropine is useful as an aid in ophthalmoscopic examinations in place of atropin, homatropine, etc.

Eucatropine-Werner.—A brand of eucatropine complying with the N. N. R. standards. Werner Drug & Chemical Company, Cincinnati Ohio (Jour. A. M. A., May 1, 1920, p. 1231).

Radium Sulphate, Radio Chemical Corp.—Supplied in the form of a mixture of radium sulphate and barium sulphate. All deliveries are made subject to the tests of the U. S. Bureau of Standards. Radio Chemical Corporation, New York (Jour. A. M. A., May 8, 1920, p. 1316).

Acetylsalicylic Acid-Heyden.—A brand of acetylsalicylic acid (see New and Nonofficial Remedies, 1920, p. 247) complying with the N. N. R. standards. Heyden Chemical Works, Garfield, N. J. (Jour. A. M. A., May 22, 1920, p. 1457).

Streptococcus Vaccine (Gilliland).—A streptococcus vaccine (see New and Nonofficial Remedies, 1920, p. 290) made from hemolytic streptococci, viridans (green-producing) streptococci and nonhemolytic streptococci. Marketed in packages of four syringes,

in packages of four 1 Cc. ampules and also in vials of 5, 10 and 20 Cc. The Gilliland Laboratories, Ambler, Pa.

Tablets Dichloraine-T, 4.6 grains.—Each tablet contains 4.6 grains of dichloramine-T-Abbott (see New and Nonofficial Remedies, 1920, p. 139. Abbott Laboratories, Chicago.

Solution Arsphenamine-Lowy.—An aqueous 0.5 per cent solution of arsphenamine possessing the proper degree of alkalinity. It is supplied in ampules containing 80 Cc. and 120 Cc., respectively, each being provided with a hypodermic needle and attachment for intravenous administration. The ampules are provided with an expiration date after which time they should not be used, and with a color standard to which they must conform. The solution is made from the particular brand of arsphenamine selected by the purchase Lowy Laboratory, Inc., Newark, N. J. (Jour. A. M. A., May 29, 1920 p. 1519).

Pituitol Obstetrical.—Pituitary Extract Obstetrical-Hollister-Wilson. An extract of the posterior lobe of the pituitary body of cattle, approximately three times the strength of Solution of Hypophysis, U. S. P., preserved by the addition of chlorbutanol. It is standardized according to the method of G. B. Roth. For actions and uses, see general article, Pituitary Gland, New and Nonofficial Remedies, 1920, p. 205. Marketed in the form of Ampoules Pituitol Obstetrical 0.5 Cc. and Ampoules Pituitol Obstetrical 1 Cc. Hollister-Wilson Laboratories, Chicago.

Pituitol Surgical.—Pituitary Extract Surgical-Hollister-Wilson. An extract of the posterior lobe of the pituitary body of cattle, approximately six times the strength of Solution of Hypophysis, U. S. P., preserved by the addition of chlorbutanol. It is standardized according to the method of G. B. Roth. For actions and uses, see general article, Pituitary Gland, New and Nonofficial Remedies, 1920, p. 205. Marketed in the form of Ampoules Pituitol Surgical 1 Cc. Hollister-Wilson Laboratories, Chicago.

Radium Bromide, Radio Chemical Corp.—Supplied in the form of a mixture of radium bromide and barium bromide. All deliveries are made subject to the tests of the U. S. Bureau of Standards. Radio Chemical Corporation, New York.

Radium Carbonate, Radio Chemical Corp.—Supplied in the form of a mixture of radium carbonate and barium carbonate. All deliveries are made subject to the tests of the U. S. Bureau of Standards. Radio Chemical Corporation, New York.

Radium Chloride, Radio Chemical Corp.—Supplied in the form of a mixture of radium chloride and barium chloride. All deliveries are made subject to the tests of the U. S. Bureau of Standards. Radio Chemical Corporation, New York.

PROPAGANDA FOR REFORM

Deterioration of Ouabain (Crystalline Strophanthin) Sclutions.—Levy and Cullen, having observed wider variation in the potency of several lots of ouabain furnished in ampules, found that the sterilized solutions were decidedly alkaline in reaction, whereas freshly prepared aqueous solutions of the drug were neutral or slightly acid. Since ouabain (crystallized strophanthin) is readily rendered biologically inert by heating with alkali, the authors ascribe the deterioration of the solutions to alkali derived from the soft glass from which ampules are often made. The deterioration may be averted by the use of containers of hard glass (Jour. A. M. A., April 3, 1920, p. 955).

Anti-Tuberculous Lymph Compound (Sweeny).—This is put out by the National Laboratories of Pittsburgh, Dr. Gilliford B. Sweeny, "Medical Director." Just how Anti-Tuberculous Lymph Compound is made today is not stated. It is fair to assume that it is not made in such a manner as to bring it under the federal laws governing the sale of serums and similar preparations. The claims made for the preparation are uncritical and unscientific, mainly of the testimonial class. When some of these testimonials were investigated, every physician who answered the inquiry regarding his previous and present opinion declared in effect that he had long since ceased to have faith in the value of the preparation. The facts are that no serum or lymph has thus far been proved to have any value in the treatment of tuberculosis. Having examined the available evidence, the Council on Pharmacy and Chemistry declared Anti-Tuberculous Lymph Compound (Sweeny) not acceptable for New and Nonofficial Remedies (Jour. A. M. A., April 3, 1920, p. 965).

Anti-Syphilitic Lymph Compound (Sweeny).—This preparation is made by or under the direction of Dr. Gilliford B. Sweeny, whose researches (?) led to the production of Anti-Tuberculous Lymph Compound (Sweeny). According to the available information, this preparation is made by suspending benzoate of mercury in lymph from the bullock. The circular exploiting this preparation makes the statement that it is seldom necessary to continue the treatment beyond two months. If one chooses to be credulous, this would indicate extraordinary power for the mercury. That any physician could be induced to place his trust in this preparation is almost unthinkable. The Council on Pharmacy and Chemistry declared Anti-Syphilitic Lymph Compound (Sweeny) not acceptable for New and Nonofficial Remedies (Jour. A. M. A., April 3, 1920, p. 966).

Pharmaceutical Houses and the Council on Pharmacy and Chemistry.—In no one direction has the Council made greater efforts than in its endeavors to secure the fullest co-operation of the various pharmaceutical houses. The difficulty has been, and always must be, the fundamental antagonism between objectives that are largely commercial, on the one hand, and purely scientific, on the other. Nevertheless, the Council has always believed that there is a possible middle ground wherein the interests of therapeutic would not be injured, but would go hand

in hand with commercial development based on enlightened self-interest. The Council has practically the undivided support of manufacturers of medicinal chemicals; but pharmaceutical firms which find it profitable to promote specialties—unscientific or ordinary mixtures of pharmaceutical or biologic products sold under trade names—have not supported the Council. The methods of the pseudochemical companies, whose sales propaganda in the interests of unscientific nostrums with its attending damage to scientific medicine had led to the establishment of the Council, has found their lodgment in most of the pharmaceutical houses. Is it any wonder that such firms are antagonistic to the work of the Council? When the medical profession as a unit will support the Council in its work, then such firms will find it good business policy to market products which are eligible for New and Nonofficial Remedies, but not before. The Council, constituted of scientific men working without remuneration in the interest of scientific medicine and the medical profession, expects—and rightfully—the co-operation and support of the members of that profession. What is needed is the active, sympathetic co-operation of physicians; the co-operation of pharmaceutical houses will follow as a matter of course (Jour. A. M. A., May 1, 1920, p. 1234).

Some Misbranded Drug Products and Nostrums.—The following products has been subject to prosecution by the federal authorities under the Food and Drugs Act: Quinin Sulphate Tablets and Calomel Tablets of the Drug Products Company, New York City, did not contain the amount of drug claimed. Acetphenetidin and Salol Tablets of the Carrol Dunham Smith Pharmacal Co., New York City, did not contain the amount of drugs claimed. Hostelley's Hypophosphites and Hostelley's Chemically Pure Hypophosphites were adulterated and misbranded. Stoddard's Pinus-Codeia, Salcetol-Codeia Tablets, Salcetol Phenylamine Ammonii Salicylate Tablets, Salcetol Co. No. 2 Infant Corrective Tablets, Cannabin Co. Tablets, G. S. Stoddard & Co., New York City, were misbranded. Dr. King's Star Crown Brand Pills were sold under false therapeutic claims. Marshall's Pain Drops, Marshall's Lung Syrup, Dr. J. C. Brown's Unequaled Liquid Drops, Marshall's Blood and Liver Pills, Egyptian Oil, and Arctic Oil Liniment of the M. W. Marshall Medicine Co. were sold under false therapeutic claims (Jour.. A. M. A., May 1, 1920, p. 1269).

More Misbranded Nostrums.—The following "patent" medicines have been the subject of prosecution by the federal authorities because they were sold under false claims: Seelye's Ner-Vena, a syrup containing alcohol and vegetable extractives, among which were those of juniper, wild cherry, cenna, gentian, sassafras, uva ursi and cinchona; Hill's Rheumatic Pills, consisting of vegetable extracts, including aloes, and 5 per cent of mineral salts; Jenkin's Rheumatism, Gout and Neuralgia Annihilator, containing over 46 per cent alcohol, salicylic acid, resinous plant extract and water. Short Stop, a syrup containing licorice and wild cherry extract, ammonium carbonate, small amounts of an antimony salt, benzoic acid, camphor, oil of anise and traces of an alkaloid. Antiseptine, a powder composed essentially of anhydrous zinc sulphate and lead acetate together with a small amount of copper acetate. Cassidy's 4X, consisting essentially of aloes, colocynth, resins, and a small amount of a mercury salt, alcohol and water. "P. G. S." (Schuh Drug Co.) consisting of plant extract including extract from a laxative drug, resin, and not more than a trace, if any, of mercury, alcohol and water. Red Cross Pile Cure, suppositories consisting essentially of cocoa butter, tannin, menthol, a lead compound, iodid, sulphate and possible acetate (Jour. A. M. A., May 22, 1920, p. 1473).

Proprietary vs. Nonproprietary.—The exhibit of the A. M. A. Chemical Laboratory at the recent New Orleans session of the A. M. A. contained a card comparing the cost of drugs sold under proprietary and nonproprietary names. The following list compared the wholesale price per ounce of drugs sold under protected (proprietary) names with the same drug sold under a common (nonproprietary) name: Aspirin-Bayer, $0.85; acetylsalicylic acid, $0.16. Phenacetin, $0.65; acetphenetidin, $0.27. Atophan, $3.50; cinchophen, $2.00. Kelene (10 gm.), $0.56; ethyl chloride (10 gm.), $0.45. Duotal, $1.90; guaiacol carbonate, $0.80. Urotropin, $0.80; hexamethylenamine, $0.21. Sulphonal, $1.70; sulphonmethane, $0.80. Trional, $1.90; sulphon-ethyl-methane, $1.00. Diuretin, $1.75; theobromine-sodium salicylate, $0.70. Aristol, $1.80; thymol iodide, $1.00. Economy as well as scientific prescribing demands the use of nonproprietary names whenever possible (Jour. A. M. A., May 22, 1920, p. 1473).

Cotton Process Ether.—The Dupont Chemical Works have decided to present "Cotton Process Ether" to the Council on Pharmacy and Chemistry for consideration, and the ether will be thus defined: An improved anesthesia ether consisting of highly refined diethyl oxid with approximately two volumes of ethylene, one-half volume carbon dioxid and one per cent by weight of ethyl alcohol (Jour. A. M. A., May 22, 1920, p. 1474).

Fumes of Iodin.—For some time manufacturers have urged substitutes for tincture of iodin, claiming that the substitutes were free from the undesirable properties of the tincture and at the same time possessed special virtues which the tincture could not possess. More recently, attention has been directed to the administration of iodin in the form of vapor. Luckhardt reports that they are rapidly and completely absorbed. It was found that the administration of iodin through the respiratory passages even in small quantities is fraught with great danger. Such administration induces dyspnea, and when it is given in large quantities, acute and fatal

pulmonary edema ensues within twenty-four hours. When respiratory disorders are present at the time of the administration, the fatal edema supervenes very quickly (Jour. A. M. A., May 29, 1920, p. 1521).

The Short and Catchy Name.—A laborer went to a Brooklyn physician for treatment and was given three prescriptions. One of the prescriptions called for "Laxol," the word being written on a piece of blank paper without directions. The drug clerk misread the prescription and dispensed an "original" bottle of "Lysol," which bore the usual poison label. The man drank the entire three ounces of "Lysol" and died. Laxol is a flavored and sweetened castor oil, and there is no excuse for prescribing it (Jour. A. M. A. May 29, 1920, p. 1524).

Hostetter's Bitters.—Hostetter's Celebrated Stomach Bitters is declared to contain 25 per cent of alcohol. Analyses in the past have shown that the alcohol content has varied widely at different times, the amount having never been less than 25 per cent by volume, but sometimes as high as 43 per cent. A recent analysis by the A. M. A. chemists showed 24.72 per cent of alcohol by volume, small quantities of cinchona alkaloids (about ¾ grain per fluidounce) and no other therapeutically active ingredients in appreciable quantities. Six fluidounces of the preparation (6 doses) were dealcoholized, the solution evaporated, the residue mixed with milk sugar, the mixture placed in capsules, and the capsules swallowed at one dose by a healthy man. No effects were noted. It is evident that alcohol is by far the most active ingredient in Hostetter's Stomach Bitters. The analysis failed to reveal the presence of any drugs in quantities that would prevent the preparation's being used as a beverage (Jour. A. M. A., May 29, 1920, p. 1534).

OF GENERAL INTEREST

Dr. Walter Courtney of Brainerd has returned from Florida.

Dr. Wm. Friesleben of St. Cloud has been appointed coroner.

Dr. A. J. Rudolph of Waseca has moved to Milwaukee where he will practice.

Dr. H. B. Weinburgh and Dr. Scarborough of Waterville are planning to open a hospital.

Dr. and Mrs. J. L. Lynch of Winona have returned from a three months sojourn in California.

Dr. Theodore Bratrud has returned to Warren from California where he spent the winter.

Dr. P. D. McCarty has severed his connections with the Biwabik hospital and has moved to Babbitt.

Dr. R. G. Doupe formerly of Upsala has entered into partnership with Dr. E. E. Hall of Little Falls.

Dr. Pierre A. Hilbert of Melrose has been appointed by Governor Burnquist to the state board of control.

Dr. M. A. Desmond formerly of Raymond, Washington, has associated himself with Dr. F. A. Allen of Crosby.

Dr. Knut Hoegh of Minneapolis celebrated his seventy-sixth birthday, April 15th. He still attends daily to his office practice.

Dr. D. Edmund Smith of Minneapolis received his second decoration from the French government; it is the Medaille Reconnaisance Francais.

The United States Civil Service announces a competitive examination for junior physiologist and assistants in psychotherapy and occupational therapy. Those interested should apply to the Civil Service Commission at St. Paul.

Dr. Harry J. Scholtes has returned from overseas to his home in Wabasha. He went to Europe in 1918 as a member of a medical unit and served to the end of the war. Later he entered the medical department of the Red Cross.

In Vienna even the essential drugs such as quinine, cocain and morphine are numbered among the necessities conspicuous by their absence. The American Red Cross has instituted a method of rationing these drugs by dispensing them at a nominal price through five reliable pharmacies.

We are informed that two French scientists, Dr. Lorman and Dr. Comandon, have worked out a radiocinematograph or combined x-ray and movie. Of how much practical value such an application will be, is questionable. The fluorescent screen should be more serviceable.

Drs. W. G. Crandall and C. J. Ehrenberg, both assistant city physician who have been stationed at the Minneapolis General Hospital for the last three years have resigned and will take up private practice. Dr. Crandall will locate in Minneapolis, and Dr. Ehrenberg will locate at Willmar.

Alpha Omega Alpha, Honorary Medical Fraternity, announces the election of the following members from the senior medical class: W. G. Benjamin, W. F. Cantwell, Frances Ford, W. W. Denny (deceased), L. H. Fowler, C. G. Gault, F. C. Kinsman, H. J. Moersch, J. L. Mills, M. E. Ryan, W. F. Widen, H. G. Zanger.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH.

FLOYD O. WOODWARD,
DONALDSON BLDG., MINNEAPOLIS.

ASTHMA, HAY-FEVER AND ALLIED CONDITIONS. Francis M. Rackemann. (Med. Clin. No. Am. vol. 3, No. 4.) The author feels that we now have conclusive proof that asthma, hay-fever urticaria and angioneurotic edema are diseases due to hypersusceptibility to foreign proteins. The individuals suffering from these diseased states are in a condition of natural sensitization which is manifested in various ways. The theories as to the causes of the hypersensitive state are all ill-defined, but they are founded on the fact that when a minute portion of the protein substance to which the patient is sensitive, is brought into contact with his skin or mucous membrane, a violent reaction takes place; but repeated injections of the same protein will many times bring about desensitization and relief of the clinical condition.

This state of natural sensitization in man is usually multiple, that is due to a number of foreign proteins. It occurs in about 10 per cent of all individuals and is inherited according to the Mendelian laws. No antibodies are demonstrable in the blood in persons naturally sensitive, although they are present in acquired sensitization in man (for instance in serum reactions.) From these and from other facts it seems that the condition of natural sensitization is not a true anaphylaxis, as we have been accustomed to think.

The information required for the diagnosis of these diseases includes (1) a careful history based on familial idiosyncracy and personal susceptibility to one or more proteins, (2) physical examination, (3) local reaction to the various purified proteins as developed by the skin test.

The vast majority of these patients require extensive and careful study as the treatment usually depends on this study. If one or more protein to which the patient is sensitive can be found, the preventive treatment will be (1) instructions as to the avoidance of ingestion of or contact with the protein or (2) desensitization with the specific protein. The desensitizating treatment is limited to those proteins soluble in bland solutions. Severe reactions sometimes occur unless the process is cautiously carried out.

FLOYD O. WOODWARD.

CHRONIC NON-TUBERCULOUS LUNG INFECTION. C. G. Field, M. D. (Am. Jour. Med. Sc. Vol. 159, No. 3) calls attention to the existence of a chest condition which may follow influenza, measles or whooping cough and which may occur both in children and adults, often being mistaken for tuberculosis. While these cases have practically identical symptoms as bronchiectasis, the author believes the condition is distinctly different altho he admits that a percentge of these cases develop bronchiectasis.

He calls attention to the fact that children have a large amount of connective tissue in the bronchi and alveoli which becomes easily infected permitting a chronic dilatation of the blood vessels to occur. Chronic respiratory irregularities such as nasal sinusitis, adenoids and diseased tonsils seem to be frequently associated.

A great variety of bacteria have been reported by various authors. Altho little opportunity has been offered for study of the associated pathology Muller believes that it "may consist of a localized bronchitis with lobular distribution which may clear up or persist in a subacute form, offering a site predisposed to exacerbations and increased tendency to fibrosis."

The X-ray may show simply some fibrous thickening.

The author believes that these cases may show any of the symptoms of tuberculosis except that no tubercle bacilli are found on repeated examinations and there is not the nutritional disturbance so characteristic of tuberculosis. These cases are extremely chronic, are prone to have exacerbations with coryza, fever, increased cough, tightening of the chest, frequent pain on the affected side and even occasionally a slight effusion.

Physical signs as a rule are insignificant but subcrepitant rales may be heard over the affected area which is usually a lower lobe and the breath sounds may be somewhat harsh. Some curving of the finger nails was found in two of the author's cases. The author believes that the inverted position is important in the treatment of this condition, having a patient lean over the foot of the bed for 15 minutes 3 or 4 times a day may be required to begin with. Inhalations of Compound Tincture of Benzoin sometimes assists. Lung exercises such as blowing into bottles and the avoidance of tobacco smoke and dust also aid. Moving to a warmer climate may lessen the tendency to exacerbation. Vaccine does not seem to help.

AN EXPERIMENTAL STUDY OF A POSSIBLE MECHANISM FOR THE EXCITATION OF INFECTION OF THE PHARYNX AND TONSILS: Mudd, Stuart and Grant (Jour. Med. Res., Boston, 1919, 40, 53). Common experience and the more sophisticated observations expressed in the majority of laryngologic and pathologic texts are agreed that excessive chilling may be an efficient factor in the excitation of the common "cold" or, more correctly stated, as the writer hopes to show in a later publication, in

the excitation of sporadic pharyngitis, tonsillitis or rhinitis, as distinguished from the epidemic coryza. As to the mechanism of excitation, current opinion has gone curiously astray; reasoning by analogy from the behavior of the viscera of chilled animals, the belief has been widely circulated that the effect of cold upon the body surface is to produce congestion of the upper respiratory mucous membranes. In the paper here abstracted it is shown that the opposite of congestion, namely, ischemia, in the mucous membranes of the palate, faucial tonsils, oropharynx and nasopharynx results from cutaneous chilling.

The method employed was that of direct measurement of mucous membrane temperature variations coincident with chilling of the body surface. Special means were devised for holding the terminals of one thermophile in opposition with the mucous membrane and of another with the skin surface; these thermophiles were connected with a rocking key with a galvanometer, with the aid of whose readings the mucous membrane and skin temperatures could be readily computed. Chilling was effected by unwrapping the subject and turning an electric fan on his bared lower back.

Respiratory rate was kept constant by breathing with a metronome, and depth with the aid of abdominal and thoracic pneumographs. With the chilling employed, no significant change in blood pressure or temperature occurred; such minimal alteration of blood temperature as did accompany chilling indeed was a slight elevation, followed on rewrapping by a slight fall. The temperatures of the mucous and skin surfaces, which were open to the air of the cold room, were, therefore, dependent upon the rate at which blood was circulated through them. Local vasoconstriction produced a fall in surface temperature, vasodilation a rise. This thermal method was checked by direct observations of color change with chilling and warming; the results of the two methods were entirely consonant.

Temperature curves obtained as described showed a parallel fall for both mucous membrane and skin, with chilling of a distant area of the body, indicating reflex peripheral vasoconstriction and local ischemia. When the subject was warmed again, the temperatures of the mucous membranes of the palate and pharynx rose, though not to their original level. Tonsillar temperature rose above its original. The skin occupied an intermediate position, reacting about to or a little above its initial temperature.

Inhalation of amyl nitrite, which causes peripheral vasodilatation by a direct relaxing effect upon the smooth muscle of the arterioles, produced a sharp transient rise of skin and mucosa temperatures parallel to the flushing of the face. Mechanical irritation is apparently also capable of checking momentarily the vasoconstriction during chilling and of causing a slight trancient vasodilation. A pharynx, the site of chronic inflammation of almost two years' standing, and attributed to excessive smoking, showed no fall in temperature in chilling, but a characteristic amyl nitrite response. The reflex arc must therefore have been interrupted in its peripheral motor elements by the inflammation or the factors responsible for the inflammation. A throat with a history of inflammation extending back only a week similarly showed on inspection no blanching with chilling. The curve of an acutely inflamed soft palate was markedly depressed by inhalation of amyl nitrite. Evidently the vessels were virtually maximally dilated in the inflammation, and increased respiration.

Scar tissue on the body surface showed reflex vasoconstriction parallel to that of the neighboring skin. The earliest scar tested and thus proved to have vasomotor fibers was at the site of an operation, performed a month before, for removal of a keloid.

In four instances exposure was followed by a "cold" or sore throat. The mucous membranes of one subject remained normal after sixteen exposures. It seems wiser to defer saying much about interpretation until a later writing. It may be said at once, however, that it does not seem in the least improbable that the ischemia of the mucous membranes resulting from the cutaneous chilling might so disturb the equilibrium between the host and the pathogenic bacteria so often found lurking in the tonsillar crypts and folds of the pharyngeal mucosa as to excite infection.

CARL L. LARSON.

OCULAR COMPLICATIONS DUE TO TYPHOID INOCULATIONS: F. Phinizy Calhoun (Arch. of Ophth. vol. 47, No. 6) records five cases of uveal infection following inoculations as a typhoid preventative. In reviewing these five cases one notes evidences of uveal inflammation apparently induced by the inoculation of the typhoid vaccine.

Morax was the first to call attention to eye complications following typhoid vaccine inoculation in 1916, followed later by Prelat, Rousseau, Bussey, Ginestous and Gloagen, and de Lapersonne. In 1917 the French Advisory Military Commission appointed de Lapersonne to investigate whether or not antityphoid inoculations could produce eye complications. He concluded that some eye cases that had been reported were not well established especially those cases of acute purulent metastatic iridocyclitis due to faulty technique, poor vaccine, or latent infection in the patient. He added, however, that there are a few cases that were closely studied and that there is every reason to believe that eye complications may be attributed directly to the use of the vaccine. He believes that the vaccine may excite an iridocyclitis in an eye that has been previously affected or may produce the initial attack in a patient either syphilitic or rheumatic. This investigator holds that there is a certain analogy between

such an occurrence and the eye reactions which occasionally follow the injections of tuberculin and arsenical preparations. He advises that before a typhoid vaccine inoculation the patient be subjected to an ophthalmological as well as a medical examination. He would exclude from inoculation all patients especially those over forty years of age who are proved tuberculous, syphilitic or arthritic or who have lesions of the uveal tract.

P. D. Berrisford.

INFLUENZA AND TUBERCULOSIS: J. Burns Amberson and Andrew Peters (Am. Rev. Tub., April, 1920). Amberson and Burns supplement a previous communication on epidemic influenza among patients and employes of the Loomis Sanatorium, Loomis, New York, with a further analysis of the histories of patients who had influenza before entering the sanatorium and a record of the incidence and fatality of this disease among former patients. They also give a critical review of recent literature on the subject.

Of 1,227 traced former patients, 70 contracted influenza and 16 (22.9 per cent) died of the disease. Of 199 new patients admitted between November 1, 1918, and November 1, 1919, 42 or 21.1 per cent gave a definite history of influenza. Of these 42, 18 knew they had tuberculosis prior to their influenza, while 26 gave a history of previous symptoms that were presumably tuberculous. In 12 cases the onset of tuberculosis was definitely post-influenzal.

The authors conclude that tuberculosis does not confer an immunity to influenza, that influenza is not less severe among the tuberculous, that among their own patients the case fatality was higher than among the general population, that among a certain number of individuals influenza marks the inception of pulmonary tuberculosis, and that to ignore or deny the possibility of pulmonary tuberculosis as a sequela is to unduly defer diagnosis and early treatment.

G. J. Hirschboeck.

ALBUMINURIA IN YOUNG MEN: Roger I. Lee has made observations on 5,000 young men, between the ages of 16 and 24, and states that 5 per cent of these men on a routine physical examination showed albuminuria in a single specimen passed at the time of the examination. The actual percentage of Bright's disease was 1/10 of 1 per cent.

He has followed many of these cases for over five years and states that as far as is known none of the cases of albuminuria which did not present other evidence of nephritis, so that the diagnosis of nephritis could be made at the time of the examination, has subsequently developed nephritis. Re-examination of 100 unselected students showed that 5 per cent of these 100 had albuminuria at the time of the examination. However, it was not the same 5 per cent which had albuminuria at the first examination. As the cases of albuminuria were observed, there was a marked tendency for the condition to disappear. Diet was not found to have any essential influence upon the disease. Dr. Lee states that albuminuria should, of course indicate a careful search for a possible nephritis, but that albuminuria without nephritis in young men has been the cause of much needless alarm. It should be recognized as an abnormal finding perhaps, but generally temporary, and not of a nature to warrant interference in any way with the normal activity of these young men.

Frank W. Spicer.

STUDIES ON EXPERIMENTAL PNEUMONIA—I. PRODUCTION OF PNEUMOCOCCUS LOBAR PNEUMONIA IN MONKEYS: Francis G. Blake and R. L. Cecil (Jour. Exper. Med., April 1, 1920). This is the first of a series of ten papers detailing experiments conducted on monkeys with artificial conditions avoided as far as possible. Types I, II, III, and IV of highly virulent strains of pneumococci were used. The method of inoculation was by direct intratracheal injection in amounts of from .000001 Cc. to 1. Cc. of an 18 hour culture, diluted to 1. Cc. when the smaller doses were used, to give uniformity in quantity of fluid. Careful clinical records, leucocyte and differential counts, and blood cultures were made. Autopsies were done in all fatal cases.

Thirty-seven injections were given: (thirty-one of type I, two of type II, three of type III, and one of type IV.) Pneumonia was produced in 32. The noticeable features were rapid development of high fever and leucocytosis, early bacteremia, and typical leucocytic reaction of non-fatal pneumonia (preliminary high P. M. N. leucocytosis followed by a fall to normal and a secondary rise). The first fall in the leucocyte count was coincident with the height of the bacteremia.

This work tends to show (1) that contact infection depends upon the entrance of virulent organisms into the respiratory tract below the larynx. (2) Their presence in the upper respiratory tract is not sufficient to produce pneumonia. (3) Subcutaneous or intravenous injections failed to produce pulmonary localization, although septicemia developed. Control with steril broth, killed cultures, and avirulent cultures were negative.

The authors feel that this series gives proof of the bronchogenic origin of pneumonia; that pneumonia develops only when the infecting agent is introduced into the lower respiratory passages and that the pneumococcus is uncapable of initiating an infection in the normal upper respiratory tract.

T. A. Peppard.

SURGERY

SUPERVISORS:
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HYPERPLASTIC TUBERCULOSIS OF THE INTESTINES: Seward Erdman (An. Surg., May, 1920). The serous form of tuberculous peritonitis is not uncommon and is often benefited by laparotomy and the removal of the appendix or fallopian tube which may be the focus of infection. In plastic or serofibrinous tuberculous peritonitis, however, and in ulcerative entero-peritoneal tuberculosis the prognosis is much less favorable. Factors which constitute indications for surgery in chronic hyperplastic tuberculosis of the intestines and which influence the results are the slow growth of a painless tumor with tendency to stenosis and obstruction, limited area of involvement permitting of excision, the attenuation of the tuberculosis infection in the lesion, and the comparative freedom from association with active pulmonary tuberculosis.

The author reports six cases in full in the original article. Tuberculosis of the intestine is encountered in four types. 1. Ulcerative type, which is a common and often primary lesion in children and a secondary lesion in adults with advanced pulmonary tuberculosis. 2. The cicatricial or stenosing type, the result of a completely healed ulcer. It usually occurs in the small intestine and may be multiple, rarely causing obstruction when found in the large intestine. 3. The entero-peritoneal type selects the ileocaecal region and combines ulceration with hyperplasia, involving the adjacent peritoneum, mesentery and lymph nodes. 4. Chronic hyperplastic tuberculosis constitutes 85 per cent of all tuberculosis of the intestines in adults. It is essentially a disease of the cecum, but is also found in the terminal ileum, the flexures of the colon, and the rectum.

The average age in the author's reported cases is just under 30 years. There is a difference of opinion as to whether it is a primary lesion or secondary to pulmonary tuberculosis. In four of the author's six cases there were definite signs of pulmonary tuberculosis. The characteristic pathology of hyperplastic tuberculosis is that of a massive thickening of the intestinal wall, especially involving the submucosa and subserous layer. The tendency is to stenosis and obstruction and usually the entire circumference of the cecum is involved. The submucosa is the seat of the earliest and greatest hyperplasia, and tubercles and giant cells are most frequently found here. The muscle coats are little affected. The overlying peritoneum is much thickened and the lymph nodes are practically always enlarged. Tuberculous peritonitis or perforation may occur.

The onset is slow and the early symptoms are indefinite gastro-intestinal disturbances, frequently with alternating constipation and diarrhoea. Fever, weight loss, and so forth, occur late unless due to pulmonary or other complications. Pain occurs with stenosis. In the author's series symptoms were present for only three months.

The differential diagnosis includes carcinoma of the cecum, appendicitis, chronic intussusception and diverticulitis or carcinoma of the sigmoid. Ileum alone, 1 case. Ileum and cecum, 1 case. Cecum or ascending colon, 2 cases. Cecum and rectum, 1 case. Sigmoid, 1 case.

Radical resection, with appropriate anastomosis, is the operation of choice. Partial exclusion is the simplest and safest procedure as a palliative treatment. An artificial anus in the afferent loop must be considered only as a measure of last resort.

V. C. HUNT.

THE TREATMENT OF DUODENAL FISTULA: Stuart McGuire (Surg. Gyn. Ob., May, 1920). A duodenal fistula usually follows an operation on the duodenum or an injury to the duodenum in the course of an operation on the gall-bladder or kidney. Such fistulas sometimes develop immediately, but more often are first noticed four or five days after an operation. They are usually due to stitches giving way or tissue strangulated by ligature or forceps undergoing necrosis. The discharge of duodenal or stomach contents may be small or large. If the fistula is small and the discharge scant, the opening may close spontaneously, but usually the fistula enlarges and unless there is surgical intervention, the patient dies.

If the discharge is small and the patient's general condition good, the fistulous opening may be plugged with gauze and all nourishment and liquid by mouth withheld. However, if the patient losses strength rapidly, more radical measures should be resorted to. If the fistula has developed following a nephrectomy, the plan suggested and practiced by W. J. Mayo should be used; that is, opening the abdomen and suturing the opening in the duodenum. Deaver and others have dealt with post-operative duodenal fistulas by doing posterior gastro-enterostomies.

The author reports a case of secondary operation in which he removed a stone from the hepatic duct and did a cholecystectomy. In the course of the operation, in the presence of dense adhesions, a hole was torn in the duodeum, which was immediately sutured. On the ninth day postoperatively a large duodenal fistula developed. The condition of the patient was such that a gastro-enterostomy could not be done, so simple jejunostomy was performed, with recovery of the patient. V. C. HUNT.

PSEUDOMYXOMA PERITONAEI: Montgomery H. Biggs (An. Surg., May, 1920). Pseudomyxoma peritonaei may be described as an inflammation or

irritation of the peritoeum, caused by the discharge of the epithelial lining and contents of a pseudomyxomatous cyst of the ovary or appendix and resulting in the production of pseudomucin and secondary tumor formation.

The author believes the etiology to be that of cellular implantation, the epithelial cells lining the cyst, together with the pseudomucinous contents of the cyst, being discharged through a rupture of the cyst wall into the peritoneal cavity. The condition was at first considered, in every instance, to be the sequel to a previously existing ovarian cyst, but Fraenkel, in 1901, observed that the appendix may be the seat of the primary pathology. In three of the author's six cases the appendix was affected. Two of these showed transplants, and one was the seat of a mucocele. Secondary involvement of the appendix is not remarkable, as any organ covered by peritoneum can be attached.

Pseudomyxoma has no distinctive symptomatology, and only in the terminal stages the patient shows weakness, loss of weight, cachexia, and so forth. It is usually a condition of advanced life; the author's youngest patient was 49 and the oldest 78. The course of the disease is usually not rapid. In one of the author's cases death did not occur until after nine years. The other five are living, after periods varying from sixteen to twenty-six months after operation. One patient had recurrence after twenty-six months, another after seven years. The disease is not a rapidly destructive process.

The findings at operation of the reported cases have been variable; however, there has always been a cyst of the ovary or appendix or both, and there is more or less pseudomucin in the pelvis or throughout the peritoneal cavity. In late cases there have been actual tumors on the abdominal viscera and great thickening of the tissues. The author states that all of the original tumor should be removed if possible, all pseudomucin as well, and the peritoneum carefully wiped off with gauze. If this is done, cures will often result, or the patients may be free from recurrence for many years. The six cases are reported in detail in the original article.

V. C. Hunt.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:

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ALBERT G. SCHULZE,
LOWRY BLDG., ST. PAUL.

THE HIGH CESAREAN OPERATION: Paul Bar, (Arch. Mensuelles D'Ob. et De Gyn., Vol. 8, No. 2.) The author gives an excellent review of his teaching and practice in the Tarnier Clinic with respect to the indications, limitations, method and results for the "High" Cesarean Operation, including 275 operations. He prefers to operate before the onset of labor or within the first few hours, before rupture of the membranes. He rigidly excludes any case which shows the slightest evidence of infection; fever or vaginitis. Their last 97 operations includes: 85 before the onset of first pains, 9 within 2 hours of onset of labor, once after 24 hours, and once after the rupture of the membranes and loss of meconium with no maternal or fetal mortality. Method: Bar prefers the high abdominal incision, delivers the fundus by pressure at the side of the incision, makes the uterine incision high on the fundus. He describes in detail his method on delivery of the ovum intact without rupture of the membranes. Clots are expressed by pressure and no packing is used. Ergot is given hypodermically. Bleeding was severe in only one case. He uses deep sutures of silk including the entire thickness of muscle, and superficial layer of catgut sutures.

He discusses the low operation with incision through the lower uterine segment but enters several objections: Injury to the bladder has occured in the hands of experts, the operation can not always be completed as an extra-peritoneal procedure when it is most desired. Delivery of the fetus and membranes is sometimes more difficult. The technique is more complicated. Immediate results: Hemorrhage is claimed to be less, but is never serious. Less risk from infection in doubtful cases a point which is of advantage to those who are less rigid in their selection of cases but not to those who follow the conservative teaching of Bar and others. He believes that there is more danger of subsequent rupture of a scar in the lower uterine segment than in the fundus. Considers that with properly selected cases, the mortality will be between 1 and 2 per cent but will run to 10 or 12 per cent or higher in unselected cases. Of his own last 97 cases, there was no mortality to mother or baby. Bar considers it a safe operation when done at the proper time, on uninfected women, by a surgeon with reasonable experience, following a standard technique.

Late complications include: 1. Uteroparietal adhesions which are common but are rarely of serious consequence. In 23 cases which came to subsequent Cesarean section there was but one where the adhesions were at all extensive. 2. Rupture of the uterine scar in subsequent labor. He quotes Essen-Moller who reports 15 cases of rupture in labor following 108 operations. Young who records 5 ruptures in 74 cases, and Rongy who estimates the frequency at about 3 per cent. In his own 22 re-operated cases Bar records: 1 rupture, 2 with marked thinning of the scar, and 19 appreciable thinning of the scar. He attributes two causes: 1. incomplete apposition of the deep muscle layer, 2. Infection. He mentions invasion by placental villi as a possible but not important factor. He considers the operation sufficiently safe to be offered with proper limitations in all cases where there is: 1. obstruction either in the

bony pelvis or soft parts which renders delivery by the vagina uncertain either by forceps or version. 2. An accident which necessitates rapid delivery when the cervix and soft parts are rigid. The last class includes eclampsia and placenta previa. The results with eclampsia are not good, probably due to the frequency of infection and it is rare that other methods of delivery are not preferable. For placenta previa he would limit the operation to those cases with severe hemorrhage where the placenta covers the cervix, which is closed, and the membranes can not be reached, where maneuvers at the cervix are most dangerous. The selection of cases is a matter of careful judgment and even then some will be subjected to operation who might possibly be delivered through the vagina.

ARCHIBALD L. McDONALD.

THE LETTSOMIAN LECTURES ON TUMORS COMPLICATING PREGNANCY, LABOR AND THE PUERPERIUM OVARIAN TUMORS: Herbert R. Spencer, (London Lancet, February 28, 1920.) This lecture is based on a series of 55 cases ranging in age from 20 to 43 years, 30 being the average. This group of 55 patients had had 150 children and 35 abortions. Forty cases were not operated on during pregnancy with the result that five of them aborted but all mothers recovered from the obortion or labor. Fifteen cases were operated on during pregnancy, and with certain allowances the abortion rate was 1 in 3; again all mothers recovered.

All tumors were benign. They were cystadenomatous in 33 cases, dermoids in 15 cases, ovarian fibroids in 3, parovarian in 6; torsion occurred in 18 cases, rupture of the tumor in 3 cases, suppuration in 8, incarceration of the tumor in the pelvis in 5 cases and adhesions were found in 26 cases.

There does not seem to be any evidence of any specially rapid growth of the tumor during pregnancy but there seems to be that tendency during the puerperium. Ovarian tumors in the non-pregnant is a surgical question; in the pregnant, however, regard should be given to its obstetrical nature and due consideration given the welfare of the child and the sterility of the mother.

In view of the fact that in the cases operated on during pregnancy the abortion rate was 1 in 3, and in those not operated on only 1 in 5 which could have been reduced to 1 in 10 if more skilfully handled during labor, it seems that operation during pregnancy involves an increased risk to the child. The author's scheme of treatment, published in 1909 and not materially changed since then is as follows: During the first half of pregnancy ovarian tumors should be removed irrespective of location or size, except (1) lutein cysts complicating hydatidiform mole; (2) bilateral tumors causing no symptoms; (3) malignant cysts.

During the second half of pregnancy he removes immediately all large and ruptured, inflamed and twisted tumors. Small tumors in the abdomen or easily pushed out of the pelvis, if without symptoms may be watched and removed at end of pregnancy, or end of the first stage and after delivery. Small incarcerated tumors may be handled in the same way but if solid or adherent, Caesarean section should be done. During labor he advocates abdominal ovariotomy; if the tumor is solid and adherent Caesarean section may be called for. At times a vaginal ovariotomy may be done and while simpler in technique it is inferior to the abdominal route. Induction of premature labor, forceps, version and tapping of the cyst as a means of overcoming the dystocia are absolutely contra-indicated.

During the puerperium all ovarian tumors should be removed within 24 hours; if sepsis is present the operation should be delayed; if conditions are urgent, it should be immediately performed.

ALBERT G. SCHULZE.

THE LETTSOMIAN LECTURES ON TUMORS COMPLICATING PREGNANCY, LABOR AND THE PUERPERIUM: CARCINOMA OF THE UTERUS: Herbert R. Spencer, (London Lancet, March 6, 1920). Reported cases taken from the literature give this complication as occurring once in 1,600 labors. Cancer of the cervix is very rare in women who have not been impregnated although cases of this complication in the first pregnancy have been reported.

The author's series of ten cases showed a total of 70 children and 11 miscarriages, an average of seven children and over eight pregnancies. The influence of multiparity is very clearly seen running throughout all statistics. He discusses the role played by lacerations, erosions, spermatazoa and venereal infections in the production of this complication.

The influence of cancer of the cervix, on account of obstruction, hemorrhage and infection is to prevent pregnancy, but if the latter condition does occur it tends to produce a premature delivery. The high mortality of this complication is due to hemorrhage, sepsis and rupture of the uterus. The influence of pregnancy, contrary to expectations, is not one of very marked stimulation to growth.

The most important symptom is hemorrhage; then the presence of a thin, watery, offensive, often blood-stained discharge, and lastly pain. The last is an earlier symptom in the pregnant than in the non-pregnant.

Cancer of the uterus in pregnancy always affects the cervix. Diagnosis is made by inspection, bimanual examination and the microscope and must be differentiated from tubercle and a chancre. Conditions resembling early cancer of the cervix are the various forms of erosions.

The author makes a survey of other published records.

Treatment of cancer of the cervix varies according as the case is operable or inoperable and the

child viable or not. Radiation treatment has come into prominence but in case of pregnancy might entail some risk to the fetus. In early pregnancy the operable cases are best handled by extended abdominal hysterectomy; the inoperable, if not bleeding or infected, are best treated by Porro operation after delivery.

During late pregnancy the cases should be treated by Caesarean section followed by extensive abdominal hysterectomy. Vaginal Caesarean section entails too great risk of cancer cell implantation and no case is recorded in which it has been followed by a cure.

On account of the high mortality associated with the extensive abdominal hysterectomy, the operation of restricted vaginal hysterectomy followed by radiation treatment is becoming more popular, specially during the puerperium. ALBERT G. SCHULZE.

PEDIATRICS

SUPERVISORS:

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ROY N. ANDREWS,
MANKATO CLINIC, MANKATO.

PROGNOSIS IN OPERATIVE CASES OF HYPERTROPHIC STENOSIS OF PYLORUS: Alton Goldbloom and Ralph C. Spence (Am. Jour. Dis. Child., April, 1920.) The duration of symptoms prior to operation is probably the most important single factor affecting the prognosis. When symptoms have lasted less than four weeks, the mortality is one-third as great as when they have lasted four weeks or longer.

The mortality in artificially fed babies is more than three times that for the breast fed babies. In infants weighing 7 pounds or less, the mortality was three and one-half times as great as in those who weighed more than 7 pounds. The mortality increases in direct proportion to the amount of weight lost previous to operation. The mortality for breast fed infants who have vomited less than four weeks and who have lost less than 20 per cent of their weight is almost nil. The fatalities which occur are due to accidents usually avoidable when the operation is done by a skillful surgeon.

The postoperative management is important. Breast milk is indispensable. At first, very small quantities of diluted breast milk are given, and increases in amount and strength are made gradually. The baby is not allowed to nurse until a week after the operation. The slightest tendency to vomiting and loose stools must be regarded with grave conconcern. He has found it advisable for the first ten days after operation to pass the catheter immediately before each feeding. This aids in the expulsion of gas. ROY N. ANDREWS.

RESULTS OF SOME EXPERIMENTAL WORK WITH SODIUM CACODYLATE ON ATHREPTIC INFANTS: Floyd S. Clarke and Andrew Dow (Am. Jour. Dis. Child., April, 1920.) The physician is rather frequently confronted with a type of infant, who, because of some nutritional disturbance, either fails to gain in weight, or the gain is so slight as to be almost negligible. This condition of insufficient nutrition is sometimes called athrepsia.

One member of this class of infants will take its food well, does not vomit, and there is no indication of digestive disturbance. The food may be of sufficient caloric value. Another member of this class, will tolerate only a certain amount of food. In feeding these infants, one has to be extremely careful not to overtax this food tolerance. They are particularly unable to digest any normal amount of fat. If their food tolerance is exceeded we get vomiting, diarrhea and loss of weight. In both types there is an inability to assimilate food properly. They do not do well, are below par physically, and anemic.

Six infants were used in this group. Eight injections of Sodium Cacodylate were given at intervals of four days, intramuscularly. The youngest which was six months old, received one-fourth grain, as an initial dose. This was increased until three-fourths grain was given. The maximum dose at any one time was one grain; the oldest child being fifteen months.

It was found that graduated doses given hypodermically had no toxic influence. The percentage of hemoglobin in the blood is uniformly increased. All the children showed a substantial gain in weight and one may conclude that the Sodium Cacodylate possesses tonic properties enabling the infant to take on weight and possibly to assimilate his food more properly. ROY N. ANDREWS.

ROENTGEN-RAY DEMONSTRATION OF ABNORMALITIES OF THE GASTRO-INTESTINAL TRACT IN CHILDREN: Charles Gilman Kerley (Am. Jour. Dis. Child., April, 1920) gives a number of interesting roentgenograms of the gastro-intestinal tract which throw light on some trying feeding problems in infants and children.

He states that the digestive tract in children has been given credit for being structurally normal and the derangements being strictly functional—this, however, is very often not the case. Opaque meals and enemata show a wide variety of abnormal anatomical changes, such as, stenoses of the pylorus, ptosis of the stomach, elongated colon, elongated and sacculated sigmoid. Clinically, the disturbances are shown by poor nourishment, pain, anorexia, vomiting and constipation. He found these symptoms were accompanied by a delayed emptying time of the stomach.

Technically, he employed one part of Bismuth subcarbonate in eight parts of the feeding mixture or fermented milk—for the meal and for the opaque

enema, one part of barium sulphate to six parts of fermented milk.

After diagnosis of the underlying condition, regulation of the feeding and especially a long interval is employed. Massage and medication for obstipation, and abdominal support in cases of ptosis have been of great help in relieving the distressing symptoms and promoting better nutrition.

FREDERICK C. RODDA.

PNEUMONIA IN INFANCY AND CHILDHOOD WITHOUT PHYSICAL SIGNS: R. G. Freeman (Archives of Pediatrics, January, 1920) emphasizes an extremely important point in pediatric work, the difficulty of making a positive diagnosis of lobar pneumonia in infancy, especially when confronted with an extensive upper respiratory infection involving the ears. Fever, over-activity of alar nasi, rapid respirations with expiratory grunt suggest pneumonia and yet no physical signs in the chest can be demonstrated. A discharging ear with tenderness over the mastoid points to a possible explanation. Just here a roentgenogram of the chest may give the true differential diagnosis and prove the pneumonia may exist without physical signs. He gives a series of histories, temperature charts and plates which are entirely convincing and urges more frequent roentgen studies in these cases.

FREDERICK C. RODDA.

ROENTGENOLOGY

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EARLY ROENTGEN DIAGNOSIS OF ULCERATED TUBERCULOUS COLITIS: Lawrason Brown and Homer L. Sampson, (Am. Rev. Tub., January, 1920.) The authors in a most comprehensive article on the symptamology and diagnosis of tuberculous colitis, make a plea for earlier diagnosis in order that surgical treatment may be instituted early while there is a better chance for recovery.

This, they assert, can only be done by a carefully carried-out x-ray examination. The findings which they describe, are found only with tuberculosis of the large intestine, but maybe absent in some cases of hypertrophic tuberculosis. Both the plate and fluroscopic methods are employed in the examination and both the ingested barium meal and barium enema are resorted to.

The diagnosis depends on abnormal hypermotility of the ingested meal as observed at six, eighteen, and twenty-four hours, after ingestion and confirmation of this hypermotility by a barium enema given under fluroscopic control. The region where the abnormally rapid passage of the ingested meal was noted will be found difficult to fill with the barium enema and once filled an almost immediate spasm of the affected area results which forces the solution analward.

They avoid all catharsis for 24 hours preceding the ingestion of the barium meal as cartharsis can cause abnormal motility of the intestinal contents.

R. G. ALLISON.

RADIUM TREATMENT OF ENLARGED THYMUS GLANDS IN INFANTS: Arthur C. Heublein. (Amer. Jour. Roent., April, 1920.) The author lays stress on the frequency of an enlarged thymus being the sole factor in sudden and otherwise unexplained death in infants.

He quotes Friedlander of Cincinnati who states that eight and four-tenths percent of all children admitted to the out-patient department of Dr. Benjamin's clinic suffered from enlarged thymus. He urges that all children be given a thorough physical and x-ray examination before the administration of a general anaesthetic, as sudden death so often occurs at this time. Even in children who have exhibited slight if any symptoms of enlarged thymus previously.

He quotes the experimental work of Park McClure of Johns-Hopkins as proof that the destruction of the thymus has no effect upon the development, strength, activity or intelligence of the experimental animal. He therefore concludes that we need not fear to completely destroy the gland.

Until two years ago the author had contented himself with routine x-ray treatment of these cases as the results were uniformly good but not always rapid. Being confronted with an almost moribund case he applied one hundred milligrams of radium element at a one-half inch distance, filtered through three-tenths m.m. of silver at 4 portals of entry, the tube being left two hours in each position. The marked immediate improvement and permanent cure has left him to adopt this treatment as his routine. The advantages of radium over x-ray treatment are as follows: (1) It is portable; (2) it gives the desired result in one treatment; (3) it eliminates fixation of the infant necessary in x-ray treatment, this factor alone accounting for many deaths during x-ray treatment owing to the struggle of the child over being forcibly restrained; (4) radium is safer as the skin-radium distance never varies regardless of movements on the part of the patient.

He reports on 41 cases treated by this method with uniformly good and lasting results.

R. G. ALLISON.

RADIUM OR ROENTGEN RAY: William J. Young. (Internat. Jour. Surg., April, 1920.) What is known of the mode of action of radium and the Roentgen ray is described, as well as the characteristic effects of the alpha, beta and gamma rays. While the

mode of administration of the two agents is different the same reactions are produced. With the x-ray one is able to treat small lesions in less time than with radium, and for large surfaces the time difference amounts to days. Radium, however, is more nearly "fool-proof" owing to the margin of safety between massive dose and burn. Radium also require less skill; hence, to a certain extent, the growing popularity of this agent.

The essentials of intelligent treatment of the diseases responsive to radium and x-rays are the ability to accurately diagnose the character and extent of the lesion, and knowledge of technique necessary for the agent selected as well as of the reactions which may be expected. One of the reasons for the slow advancement of radio-therapy is the reluctance of those proficient in its use to explain their technique; due to the fact that so many untrained workers have adopted therapy as a "side issue."

In general, the most eligible situations for radium are those inaccessible to the Roentgen ray: (1) the nose and antrum; (2) the mouth, larynx, pharynx, oesophagus and bronchi; (3) the urinary bladder and prostate; (4) the vagina, cervix and uterus; (5) the rectum; (6) naevi and keloids. In many cases radium may be supplemented by x-rays from the outside. Roentgen ray therapy may be used over small and large surafces, especially in malignant disease with metastasis. In mammary carcinoma with small recurrences in the scar, the author believes it a mistake to apply radium where systematic radiation of a large field is required. The Roentgen ray is usually employed in hyperthyroidism; and in leukemia it is the agent of choice. The x-ray is more efficient in extensive sarcomata, but needles of radium element or emanation buried beneath the skin will be found of special value. The greatest field of radium will be found in carcinoma of the cervix. It is also the agent of choice in uterine hemorrhage unless the patient still hopes to bear children. In extensive skin diseases the treatment is almost inclusively by the Roentgen ray.

A. U. Desjardins.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

A. M. A. Council on Pharmacy and Chemistry Reports, 1919.

New and Non-Official Remedies. A. M. A., 1920.

Surgical Clinics of Chicago, April, 1920. W. B. Saunders Co.

Medical Clinics of North America, March, 1920. W. B. Saunders Co.

Human physiology. Starling. Lea & Febiger. 3rd ed. 1920. $7.50.

Diseases of the Nervous System. Jelliffe and White. Lea & Febiger 1919, 3rd ed. $8.00.

Pathogenic Micoorganisms. Park and Williams. Lea & Febiger. 7th ed. 1920. $6.00.

Symptoms of Diagnosis and Disease. Hare. Lea & Febiger. 8th ed 1920. $6.00.

Physical Diagnosis. Flint and Thacher. Lea & Febiger. 1920. $3.00.

Diabetic Manual. Joslin. Lea & Febiger. 2nd ed. 1919. $1.75.

Dermatology. Darier. Lea & Febiger. 1920. $8.50.

Regional Anesthesia. Sherwood-Dunn. F. A. Davis Co. 1920. $3.50.

Principles and Practice of Infant Feeding. Hess. F. A. Davis Co. 2nd ed. 1919, $2.50.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS. By Hobert Amory Hare, M. D., B. SC., Professor of Therapeutics, Materia Medica, and Diagnosis in the Jefferson Medical College of Philadelphia; Physician in the Jefferson Medical College; etc. Seventeenth Edition, Price $5.50.

During the past thirty years hitherto empirical methods have in many instances been placed upon a scientific basis. These the author has thought fit to incorporate in the work as well as to develop new lines of treatment. The new work added consists of the more modern treatment of shock, the use of Dakin's fluid and dichloramine-T by Carrel's methods and the treatment of burns with paraffine. This volume stands as the leader in texts of its kind.

DISEASES OF WOMEN. Charles M. Green, Professor of Obstetrics and Gynecology, Emeritus, in Harvard University, etc., W. M. Leonard, Publishers, $6.00.

This book is the author's second edition. It is one of the case history series. A book of 466 pages and 173 case histories, dealing with gynecological problems during the recognized periods of female life, namly, infancy and childhood, puberty and adolescence, maturity, climateric and senility. Also dealing with the closely allied question of normal and pathological pregnacy, labor and puerperium as influenced by gynecological conditions. It is a valuable and interesting volume.

Albert G. Schulze.

MINNESOTA MEDICINE

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ORIGINAL ARTICLES

AURICULAR FIBRILLATION AND LIFE EXPECTANCY

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The most important and most frequent disorder of cardiac rhythm is that due to fibrillation of the auricles. Its presence in varying degrees of heart disease renders a prognosis exceedingly difficult at times. Prognosis in heart disease of course cannot be based on one factor but must result from the sum-total of evidence, subjective and objective, and from knowledge gained by adjunct methods.

Cardiac efficiency is determined by the integrity of the myocardium, especially of the ventricular myocardium, as life is dependent directly on the function of these chambers. Other cardiac defects are factors largely modifying the true issue.

A

AURICULAR FIBRILLATION—COMPLETE SERIES

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
11-20	5	3	1	2	0	1	1	1					3 yrs. 2 mos.
21-30	37	29	19	10	3	6	4	16x y z		x Tuberculosis y Pneumonia z Influenza	6 days	2 yrs. 4 mos.	1 yr. 2 mos.
31-40	79	58	28	30	9	12	8	29x y		x ? y Pneumonia	13 days	2 yrs. 4½ mos.	11 mos.
41-50	129	104	46	58	29	25	13	37x y z		x Apoplexy y ? z ?	3 days	3 yrs. 3½ mos.	11 mos.
51-60	158	126	63	63	28	30	23	45x y z		x Cerebral Hemorrhage y Pneumonia z Cholangitis	8 days	3 yrs.	10½ mos.
61-70	77	58	35	23	2	15	7	34v w x y z		v Carcinoma of the Tongue w Carcinoma of the Thryoid x Pneumonia y Diabetes z Peritonitis	15 days	2 yrs. 5 mos.	11 mos.
71-80	15	14	11	3	0	0	3	11x y z		x Carcinoma of the Cardia y Carcinoma of the Stomach z Uremia	4 days	2 yrs. 5 mos.	11 mos.
Total	500	392	203	189	71	89	59	173 19 154 cardiac	41.3		8 days	2 yrs. 8 mos.	1 yr. 3 mos.

*Presented before the Minnesota State Medical Asso ciation, Minneapolis, October 1-3, 1919.

As yet, no method of precision is known for determining cardiac efficiency, but the cardiovascular response to effort is probably the most satisfactory. The obvious objection to this method is the personal equation which materially influences interpretations.

In dealing with an issue as uncertain as life is at best, no physician can conscientiously tell a patient that he will live a specified number of years, months, or days. The object of this study is not to advocate such dogmatism but to corroborate clinical impressions with statistics.

The present analysis is based on 500 cases of auricular fibrillation in which electrocardiographic examinations have been made at the Mayo Clinic. The cases of fibrillation in which electrocardiographic examinations were not made are not included for reasons of group standardization. This series covers a period of four and one-half years. The cases have been grouped for comparative study, and, while the classification is not without certain objections, its employment is quite satisfactory. The statistics are tabulated in Tables 1 to 26.

Group A—Complete series of 500 cases of auricular fibrillation.

Group B—Uncomplicated auricular fibrillation.

A
CONTROL SERIES

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death. Shortest time	Longest time	Average time
11-20	5	4	1	3	2	2	0	0					
21-30	37	26	7	19	4	6	11	5x w		x Tuberculosis of the kidney w ?	15 days	2 yrs. 10½ mos.	1½ yrs.
31-40	79	63	10	53	20	23	13	7x y z		x Intra-abdominal hemorrhage y ? z Pneumonia	2½ mos.	1¼ yrs.	7½ mos.
41-50	129	100	29	70	32	22	31	15u v w x y z		u ? v ? w Sarcoma x Nephritis y Apoplexy z ?	10 days	3½ yrs.	10½ mos.
51-60	158	130	53	77	32	38	29	31r, s, w t, x u, y v, z		r Carcinoma of the Stomach s Pneumonia w ? t Apoplexy x ? u ? y Pneumonia v ? z Killed	4 days	3 yrs. 5 mos.	9 mos.
61-70	77	63	42	22	14	12	19	18r s t u v w x y z		r Gallbladder Disease s Carcinoma of the Liver t Carcinoma of the Rectum u Carcinoma of the Pancreas v Carcinoma w Abdominal Carcinoma x Abcess of Lung y ? z ?	9 days	1 yr. 2 mos.	5½ mos.
71-80	15	13	10	3	2	4	2	5y z		y ? z Apoplexy	4 mos.	8 mos.	6 mos.
Total	500	399	152	247	106	107	105	81 31 — 50 cardiac	13.6		1 mo. 9 days	2 yrs. 2 mos.	9 mos.

Group B_1—Auricular fibrillation with premature ventricular contractions.

Group B_2—Auricular fibrillation with arborization block.

Group B_3—Auricular fibrillation with arborization block and premature ventricular contractions.

The groups complicated by arborization (impaired intraventricular conduction) include only those cases in which the ventricular conduction system was diffusely involved, as expressed by the presence of abnormal ventricular complexes in all three derivations of the electrocardiogram. In a previous publication[2] I have emphasized the gravity of this disorder unattended by abnormalities.

Group C comprises chronic valvular diseases, grouped with reference to the type of lesion. The criteria adopted for the diagnosis of mitral stenosis in the presence of auricular fibrillation are those laid down by Mackenzie, namely, the presence of a diminuendo apical murmur, diastolic in time.

Group C—Auricular fibrillation in mitral insufficiency.

Group C_1—Auricular fibrillation in mitral stenosis.

Group C_2—Auricular fibrillation in double mitral lesion (insufficiency and stenosis).

Group C_3—Auricular fibrillation in aortic insufficiency.

Group D includes diseases of the myocardium, chronic myocarditis in the strict sense of a chronic inflammatory process, and myocardial degenerations secondary to other conditions.

Group D—Auricular fibrillation in chronic myocarditis.

Group D_1—Auricular fibrillation in myocardial disease secondary to hypertension with and without clinical nephritis.

Group D_2—Auricular fibrillation in myocardial disease secondary to exophthalmic goiter (hyperplastic toxic).

B
UNCOMPLICATED AURICULAR FIBRILLATION.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
11-20	4	2	0	1	1	1	0	0					
21-30	27	22	13	9	3	5	3	11x y z		x Tuberculosis y Pneumonia z Influenza	6 days	2 yrs. 4½ mos.	9 mos.
31-40	57	39	18	21	5	9	6	19y z		y ? z Pneumonia	13 days	2 yrs. 4½ mos.	11½ mos.
41-50	101	82	34	48	23	20	11	28y z		y ? z Apoplexy	5 days	3 yrs. 3½ mos.	11 mos.
51-60	118	89	39	50	22	25	13	29x y z		x Cerebral Hemorrhage y Pneumonia z Cholangitis	3 days	3 yrs.	13 mos.
61-70	50	39	26	13	3	13	2	21w x y z		w Carcinoma of the Tongue x Pneumonia y Diabetes z Peritonitis	14 days	2 yrs. 5 mos.	13 mos.
71-80	10	9	7	2	0	0	3	6y z		y Carcinoma of the Cardia z Carcinoma of the Stomach	4 days	1 yr.	4 mos.
Total	367	282	137	144	57	73	38	114 16 98 cardiac	36.9		7½ days	2 yrs. 5 mos.	10 mos.

Group D_3—Auricular fibrillation in myocardial disease secondary to thyrotoxie adenomas (non-hyperplastie toxic).

Control series to all groups are compiled, corresponding in total number, occurrence by decades and sex. The patients comprising this series all received eleetrocardiographie examinations. An attempt was made to make the control series a just comparison; it seemed best, therefore, to exelude the graver forms of heart disease, namely angina peetoris, arborization block, and lesions of the auriculoventricular bundle, aortic disease, and auricular flutter.

Letters were sent to all patients questioning them relative to their cardiac status, and in event of death, requesting the relatives or friends to forward the date and exact eause of death. A third letter was sent in some instanees.

A glanee at these statistics at onee reveals the increased mortality attending heart disease eomplieated by auricular fibrillation. In most instanees the death rate was doubled and trebled. The arrhythmia per se is, of course, not the determining factor.

CONCLUSIONS

The mortality attending auricular fibrillation doubles and in some groups trebles that

B

UNCOMPLICATED SINUS RYTHM—CONTROL SERIES

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
11-20	4	3	1	2	1	2	0	0					
21-30	27	20	4	16	4	5	9	2			15 days	2 yrs.	1 yr. 5½ mos.
31-40	57	47	5	42	15	17	8	7v w x y z		v ? w Intrabdominal Hemorrhage x Pneumonia y Pneumonia z ?	3½ mos.	1 yr. 3 mos.	9½ mos.
41-50	101	78	20	58	28	14	24	12v w x y z		v ? w ? x Sarcoma y Nephritis z Apoplexy	10 days	2 yrs.	7 mos.
51-60	118	98	38	60	24	27	24	23v w x y z		v Carcinoma of the Stomach w Pneumonia x Apoplexy y ? z ?	4 days	1 yr. 3 mos.	6½ mos.
61-70	50	43	29	14	7	11	10	15s t u v w x y z		s Gallbladder Disease t Carcinoma of the Rectum u Carcinoma of the Liver v Carcinoma of the Pancreas w Carcinoma x Abdominal Carcinoma y Lung Abscess z ?	9 days	1 yr. 2 mos.	5½ mos.
71-80	10	9	7	2	1	3	1	4y z		y ? z Apoplexy	4 mos.	8 mos.	6 mos.
Total	367	298	104	194	80	79	76	63 25 — 38 cardiac	16.2		1 mo. 9 days	1½ yr.	8½ mos.

occurring in similar types of heart disease not complicated by this arrhythmia. It is logical to conclude, therefore, that patients suffering from heart disease in whom auricular fibrillation has not occurred have a greater life expectancy.

B-1
AURICULAR FIBRILLATION WITH PREMATURE VENTRICULAR CONTRACTIONS.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
11-20	1	1	0	1	0	0	0	1					3 yrs.
21-30	7	5	4	1	0	1	1	3			2 mos.	2 yrs.	2 yrs.
31-40	17	15	8	7	1	2	5	7			5½ mos.	3½ yrs.	1½ yrs.
41-50	20	14	6	8	4	4	2	4			10 days	1½ yrs.	6½ mos.
51-60	26	23	15	8	3	6	8	6			17 days	1 yr. 3 mos.	6 mos.
61-70	16	9	4	5	0	2	1	6			6 days	1 yr. 3 mos.	9 mos.
71-80	2	2	1	1	0	0	0	2			1 mo.	1 yr. 9 mos.	11 mos.
Total	89	69	38	31	8	15	17	29	42.0		1½ mos.	1 yr. 10½ mos.	1½ yrs.

B-1
PREMATURE VENTRICULAR CONTRACTIONS—CONTROL SERIES

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
11-20	1	0	0	0	0	0	0	0					
21-30	7	5	1	4	0	3	2	2					
31-40	17	14	4	10	2	5	5	2x		x Carcinoma			28 days
41-50	20	17	9	8	2	7	3	5x y		x Influenza y Peritonitis	1½ mos.	2 yrs. 10½ mos.	1 yr. 8 mos.
51-60	26	19	9	10	3	8	5	3x y		x Indeterminate y Carcinoma			8½ mos.
61-70	16	11	9	2	1	3	2	5			5 mos.	2 yrs. 4 mos.	1 yr. 2 mos.
71-80	2	2	2	0	0	2	0	0					
Total	89	68	34	34	8	28	17	15 5 — 10 cardiac	15.9		3 mos.	2 yrs. 7 mos.	10 mos.

B-2

AURICULAR FIBRILLATION WITH ARBORIZATION BLOCK.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
21-30	1	1	1	0	0	0	0	1					11½ mos.
31-40	5	3	3	0	0	0	1	2			3½ mos.	5 mos.	4½ mos.
41-50	7	6	4	2	2	1	0	3			2½ mos.	2 yrs.	1 yr.
51-60	9	8	5	3	0	2	0	6			2 mos.	1 yr. 10 mos.	9 mos.
61-70	9	8	5	3	0	1	3	4			23 days	1 yr. 4 mos.	8 mos.
71-80	2	2	2	0	0	0	0	2x		x Pneumonia			7 mos.
Total	33	28	20	8	2	4	4	18 1 17 cardiac	63.4		2 mos.	1 yr. 5 mos.	9 mos.

B-2

ARBORIZATION BLOCK—CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
21-30	1	1	1	0	0	1	0	0					
31-40	5	3	2	1	0	1	0	2x		x Pneumonia			16 days
41-50	7	4	2	2	1	0	1	2x		x ?			6 mos.
51-60	9	9	5	4	2	1	1	5x		x ?	1 mo.	4 mos.	9½ mos.
61-70	9	8	4	4	0	2	0	6			1½ mos.	1 yr.	6 mos.
71-80	2	2	1	1	1	0	0	1					3 mos.
Total	33	27	15	12	4	5	2	16 3 13 cardiac	54.2		1 mo.	7 mos.	5 mos.

REFERENCES

1. Mackenzie, J.: Diseases of the heart. London, Frowde, 222-223, 1914.

2. Willius, F. A.: Arborization block. Arch. Int. Med., xxiii, 431-440, April, 1919.

DISCUSSION

DR. S. MARX WHITE, Minneapolis: Mr. Chairman, Ladies and Gentlemen: This study of Dr. Willius is one of the most interesting that I have seen and I covet an opportunity to study more fully the tables which he has given. Naturally, in a hasty re-

B-3
AURICULAR FIBRILLATION WITH ARBORIZATION BLOCK AND PREMATURE VENTRICULAR CONTRACTIONS.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
21-30	2	1	1	0	0	0	0	1x		x Influenza			
41-50	1	1	0	1	0	0	0	1					2 mos.
51-60	5	4	3	1	1	0	0	3			2½ mos.	1 yr.	8½ mos.
61-70	2	2	1	1	0	0	0	2			1½ mos.	7 mos.	4 mos.
71-80	1	1	1	0	0	0	0	1					1 yr.
Total	11	9	6	3	1	0	0	8 1 — 7 cardiac	87.5		2 mos.	1 yr.	6 mos.

B-3
ARBORIZATION BLOCK WITH PREMATURE VENTRICULAR CONTRACTIONS —CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
21-30	2	1	1	0	0	0	0	1					2½ mos.
41-50	1	1	1	0	0	0	0	1					5 mos.
51-60	5	4	4	0	0	0	0	4					3 mos.
61-70	2	2	2	0	0	1	0	1					10 mos.
71-80	1	1	0	1	0	0	0	1x		x Carcinoma			
Total	11	9	8	1	0	1	0	8 1 — 7 cardiac	87.5				5 mos.

view of this kind he can touch only the peaks and give us only a sketch, but it is evident that these tables bring out a number of points which are of very great importance in the end results, not only in auricular fibrillation, but in allied condition. Dr. Willius brings out one point which I think deserves emphasis, and that is the liability to better management in cases with irregularity. I think that at the present time it has not become widespread among the profession to recognize the type of irregularity present in a cardiac case, but it is possible with careful study in a great majority of instances for the practitioner to recognize these irregularities without the aid of the electrocardiograph. Our own experience has told us that the study with fine graphic methods gives us a very much better insight into cases than when studied clinically. The study of such cases by means of the electrocardiograph has taught us to recognize without the electrocardiograph, and even without the polygraph, many cases, particularly of auricular fibrillation. Since that is the most frequent serious irregularity and since the extra systole can be in a

C
AURICULAR FIBRILLATION IN MITRAL INSUFFICIENCY.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
11-20	2	1	0	1	0	0	1	0					
21-30	12	7	5	2	0	3	0	4			2 mos.	2 yrs.	1 yr. 2 mos.
31-40	18	13	11	2	1	2	3	7			1 mo.	1 yr. 10 mos.	7 mos.
41-50	22	17	12	5	3	4	1	9			10 days	2 yrs. 7 mos.	1 yr. 3 mos.
51-60	11	8	5	3	2	2	1	3			1 mo.	1 yr. 1 mo.	8 mos.
61-70	6	5	3	2	0	1	1	3			14 days	1 yr. 1 mo.	7 mos.
71-80	1	1	1	0	0	0	0	1					1 yr. 2 mos.
Total	72	52	37	15	6	12	7	27	51.9		1 mo.	1 yr. 8 mos.	11 mos.

C
MITRAL INSUFFICIENCY—CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
11-20	2	1	1	0	0	1	0	0					
21-30	12	10	4	6	1	4	5	0					
31-40	18	13	3	10	2	6	2	3x		x Pneumonia	9 mos.	1 yr.	11 mos.
41-50	22	17	11	6	2	3	5	7x y		x ? y Nephritis	2 mos.	2 yrs.	9 mos.
51-60	11	10	6	4	2	2	2	4			1 mo.	½ yr.	3½ mos.
61-70	6	5	4	1	0	1	1	3			2 mos.	1 yr. 1 mo.	1 yr.
71-80	1	1	1	0	0	0	0	1					
Total	72	57	30	27	7	17	15	18 3 — 15 cardiac	27.8		3½ mos.	1 yr. 1½ mos.	9 mos.

great majority of instances recognized, it is well for everyone of us to apply ourselves to the problem long enough to be able to recognize it. The other features which are associated with the auricular fibrillation such as arborization block, etc., are states which require study with the electrocardiograph to bring out.

C-1
AURICULAR FIBRILLATION WITH MITRAL STENOSIS.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
21-30	4	3	1	2	0	0	1	2			1 mo.	2 yrs. 4 mos.	9 mos.
31-40	10	5	2	3	0	2	1	2			9 mos.	10½ mos.	10 mos.
41-50	7	5	1	4	1	1	1	2			5 mos.	10½ mos.	7½ mos.
51-60	5	3	1	2	0	1	1	1					
61-70	1	1	1	0	0	0	0	1					½ mo.
Total	27	17	6	11	1	4	4	8	47.1		5 mos.	1 yr. 4 mos.	7 mos.

C-1
MITRAL STENOSIS—CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
21-30	4	2	1	1	0	0	1	1					2 yrs. 10 mos.
31-40	10	6	4	2	0	4	0	2x		x ?			1 yr. 4 mos.
41-50	7	6	1	5	1	2	1	2x		x Pneumonia			4 mos.
51-60	5	5	1	4	1	2	1	1					1½ mos.
61-70	1	1	0	1	0	0	1						
Total	27	20	7	13	2	8	4	6 2 4 cardiac	22.2				1 yr. 2 mos.

The arborization block can be emphasized only at present by the electrocardiograph and that emphasizes the need for the wider use of these careful studies in cardiac cases. Its greater use places in the hands of the profession an opportunity to get these data and since also, the appearance of auricular fibrillation is the one indication,—I say the one indication that I know, at least,—for the administration of digitalis, I think it is particularly important for the practitioner to learn to recognize its presence even though he may not be able always to recognize certain other complicating factors that Dr. Willius has brought out.

DR. E. L. TOUHY, Duluth: I had the pleasure of meeting Mackenzie in 1912 and hearing some of his lectures in London. It was evident that he did not then appreciate as much as is now appreciated that these irregularities sometimes overlap, and having made a diagnosis of auricular fibrillation or extra systole does not mean that all the case is settled. He has studied these cases for many years and his particular point was to find out how long people were going to live, but on going over his records he found where he had made mistakes for many years and others making them right along, and while we as a profession were interested in the diagnosis, the pa-

C-2
AURICULAR FIBRILLATION WITH DOUBLE MITRAL LESION.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
11-20	3	2	1	1	0	1	0	1					3 yrs. 10½ mos.
21-30	6	5	5	0	1	1	1	2			7 mos.	1 yr.	9 mos.
31-40	14	10	4	6	0	2	2	6			3 mos.	1yr. 10 mos.	10½ mos.
41-50	9	7	2	5	1	1	2	3			1 mo.	3 yrs. 2 mos.	1 yr. 9 mos.
51-60	6	3	1	2	0	1	0	2x		x Cholangitis			3 yrs.
61-70	2	2	1	1	0	0	0	2			7 mos.	9 mos.	7½ mos.
Total	40	29	14	15	2	6	5	16 1 15 cardiac	53.4		4½ mos.	1 yr. 8 mos.	1 yr. 10 mos.

C-2
DOUBLE MITRAL LESION—CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
11-20	3	1	1	0	0	0	0	1					2 mos.
21-30	6	5	1	4	1	1	2	1x		x Influenza			
31-40	14	12	1	11	1	3	5	3x		x Pneumonia	5 mos.	1 yr.	8 mos.
41-50	9	6	2	4	1	1	0	4			1½ mos.	2 yrs. 7½ mos.	10½ mos.
51-60	6	5	3	2	1	1	0	3x y		x ? y ?			1 yr. 3 mos.
61-70	2	1	1	0	0	0	0	1					1 yr.
Total	40	30	9	21	4	6	7	13 4 9 cardiac	34.6		3 mos.	1 yr. 9½ mos.	11 mos.

tient was much more interested in the prognosis. Like the man who said he would give ten thousand dollars to know where he was going to die. A friend asked him why he wished to know and he said "Because if I did know I never would go near the place." (Laughter.)

DR. L. A. NIPPERT, Minneapolis: Mr. Chairman, Gentlemen: I think the insistence of Dr. White that these things can be diagnosed by clinical methods is very timely. In a regular practice you do not always have access to an electrocardiograph, and even if you have, you have to have an expert to interpret the

C-3
AURICULAR FIBRILLATION WITH AORTIC INSUFFICIENCY.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
21-30	2	2	2	0	0	0	0	2x		x Influenza			10 mos.
41-50	5	3	1	2	0	3	0	0					
51-60	4	3	3	0	1	0	1	1					9 mos.
61-70	2	2	2	0	0	0	0	2			¼ mo.	¾ mo.	½ mo.
Total	13	10	8	2	1	3	1	5 1 4 cardiac	44.4		¼ mo.	¾ mo.	6½ mos.

C-3
AORTIC INSUFFICIENCY—CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
21-30	2	1	1	0	0	0	0	1					6 days
41-50	5	5	3	2	1	0	1	3x		x ?	1 yr. 1 mo.	1 yr. 8 mos.	1 yr. 5 mos.
51-60	4	2	2	0	0	0	0	2x		x ?			1 mo.
61-70	2	2	2	0	0	0	0	2x		x Peritonitis			6 mos.
Total	13	10	8	2	1	0	1	8 3 5 cardiac	71.4		1 yr. 1 mo.	1 yr. 8 mos.	6 mos.

findings. But we have our fingers and hands, our ears and our eyes, but sometimes—as the scripture says—we have eyes and see not, ears and hear not, and many times we do not use the natural things we have. I think, however, that all these apparatuses have given us a great insight into the workings of the different heart muscles, of which we had no idea before. I think the combination of the two, in obscure cases, helps us find the cause and give a correct diagnosis and proper treatment.

DR. S. P. REES, Minneapolis: I hestitate to voice one thought that has come to me while hearing the paper read, but it is in regard to taking care of heart conditions before auricular fibrillation comes on. This paper is very interesting because it attempts to show the relationship between auricular fibrillation and the continuation of health and life. The papers that we have had during the last few years have contained the things with just the diagnosis, and then called attention to the digitalis. These tables have seemed to emphasize what, at a meeting of this kind where there are many general practitioners, should get firmly fixed in your mind. The first thought, that auricular fibrillation is an incurable condition; the second that it is a late complication or development not in every, but in very many chronic heart ailments, where the heart power is worn out. It is important that we pay very close attention to the very first infringement on the integrity of the heart. I want to speak particularly of the effect of valvular leakage. It is in the late stages of these valvular defects that we most assuredly get auricular fibrillation, and I want to emphasize this because that is the heart lesion that we can all recognize. It is quite

D
AURICULAR FIBRILLATION IN CHRONIC MYOCARDITIS.

Decade	Total	Patients head from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
21-30	1	1	1	0	0	0	1	0					
31-40	11	8	5	3	0	4	1	3x		x ?	2 yrs. 2 mos.	2 yrs. 4 mos.	2 yrs. 3 mos.
41-50	13	10	9	1	3	3	1	3x		x ?	3 mos.	1 yr.	10 mos.
51-60	31	25	20	5	5	7	3	10			4½ mos.	2 yrs. 9 mos.	11 mos.
61-70	13	9	4	5	0	5	1	3			1 yr. 1 mo.	1½ yrs.	1 yr. 3 mos.
71-80	12	10	10	0	0	0	3	7v w x y z		v Carcinoma of the Cardia w Pneumonia x Carcinoma of the Stomach y Uremia z Uremia	1 mo.	9 mos.	5 mos.
Total	81	63	49	14	8	19	10	26 7 19 cardiac	33.9		9 mos.	1 yr. 8 mos.	1 yr. 2 mos.

D
CHRONIC MYOCARDITIS—CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
21-30	1	0	0	0	0	0	0	0					
31-40	11	8	4	4	0	2	1	5x		x Carcinoma	6 mos.	2 yrs.	1 yr. 4½ mos.
41-50	13	10	5	5	0	5	2	3			2 mos.	2 yrs. 7½ mos.	1 yr.
51-60	31	26	18	8	4	6	2	14x y		x Carcinoma y Peritonitis	7 days	1 yr. 8½ mos.	5 mos.
61-70	13	11	7	4	1	3	3	4x		x Carcinoma	1 mo.	3 mos.	1½ mos.
71-80	12	11	10	1	1	2	2	6x y		x ? y Pneumonia	3 mos.	6½ mos.	4½ mos.
Total	81	66	44	22	6	18	10	32 6 26 cardiac	43.3		2½ mos.	1 yr. 5 mos.	8 mos.

easy when there is a murmur. In the literature there has been a very marked tendency to minimize the effect of valvular leakage. That may be true, but I have failed to reach this conclusion from personal

D-1

AURICULAR FIBRILLATION IN MYOCARCIAL DISEASE SECONDARY TO HYPERTENSION WITH AND WITHOUT CLINICAL NEPHRITIS.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
21-30	2	1	1	0	1	0	0	0					
31-40	3	3	2	1	0	1	1	1					½ mo.
41-50	15	11	5	6	1	1	2	7			1 mo.	10 mos.	5 mos.
51-60	37	25	16	9	4	6	3	12			½ mo.	2 yrs. 10 mos.	11½ mos.
61-70	40	26	15	11	0	5	4	17x y z		x Carcinoma of the Tongue y Diabetes z Peritonitis	1 mo.	2 yrs. 5 mos.	1 yr.
71-80	1	1	0	1	0	0	0	1					1 yr.
Total	98	67	39	28	6	13	10	38 3 35 cardiac	54.7		25 days	2 yrs.	8 mos.

D-1

MYOCARDIAL DISEASE SECONDARY TO HYPERTENSION WITH AND WITHOUT CLINICAL NEPHRITIS—CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
21-30	2	1	0	1	0	0	0	1					2 mos.
31-40	3	2	1	1	0	0	0	2x		x Intra-abdominal Hemorrhage			1½ mos.
41-50	15	12	5	7	2	3	1	6x y		x Apoplexy y Apoplexy	1 mo.	2 yrs.	10 mos.
51-60	37	28	17	11	4	4	3	17v w x y z		v ? w ? x Apoplexy y ? z Cancer	9 days	1½ yrs.	6½ mos.
61-70	40	33	24	9	2	5	5	21w x y z		w ? x Carcinoma of the Tongue y Carcinoma of the Rectum z Hodgkin's Disease	9 days	2 yrs. 1 mo.	9 mos.
71-80	1	1	1	0	0	0	1	0					
Total	98	77	48	29	8	12	10	47 12 35 cardiac	53.8		½ mo.	1 yr. 10 mos.	6 mos.

D-2
AURICULAR FIBRILLATION IN MYOCARDIAL DISEASE SECONDARY TO EXOPHTHALMIC GOITER.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Deaths after thyroidectomy	Time interval from examination until death		
												Shortest time	Longest time	Average time
21-30	11	10	4	6	1	2	1	6x		x Tuberculosis	0	7 days	2 yrs.	7 mos.
31-40	19	17	2	15	5	2	1	9x y		x ? y Pneumonia	3	2 mos.	3½ yrs.	11 mos.
41-50	40	33	9	21	11	7	4	11x		x Apoplexy	3	5 days	3 yrs. 3 mos.	7½ mos.
51-60	24	22	10	12	9	4	4	5x		x Apoplexy	0	3½ mos.	1 yr. 9 mos	9 mos.
61-70	3	3	3	0	0	1	0	2x		x Carcinoma of the Thyroid	0			
Total	97	85	28	57	26	16	10	33 6 — 27 cardiac	34.2		6	1½ mos.	2 yrs. 7½ mos.	8½ mos.

D-2
MYOCARDIAL DISEASE SECONDARY TO EXOPHTHALMIC GOITER—CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death		
											Shortest time	Longest time	Average time
21-30	11	8	2	6	0	4	2	2			½ mo.	5 mos.	3 mos.
31-40	19	16	1	15	8	2	4	2x		x Pneumonia			1 yr. 3 mos.
41-50	40	35	6	29	13	14	8	6y z		y ? z Tetany	10 days	1 yr. 10 mos.	2 yrs. 7 mos.
51-60	24	23	7	16	12	7	4	4			½ mo.	10½ mos.	4 mos.
61-70	3	3	1	2	0	0	0	3			1 mo.	11 mos.	4 mos.
Total	97	85	17	68	33	27	18	17 3 — 14 cardiac	17.1		½ mo.	1 yr.	11½ mos.

observation of a large number of young people whom I have followed for 15 or 16 years and whom I began to see when they were little children. I have followed them up and while it is possible that we may add to the injury to the heart muscles during these years, and while I cannot say how much the heart muscle was injured originally, I know that these young adults have taken good care of themselves, but in spite of this, as the years go on I find they are beginning to lose out. I should like very much to know how closely these cases were followed by the writer,—whether they were just seen at the clinic for a short period and then allowed to go home, and whether is it not known how sensibly they lived or

D-3

AURICULAR FIBRILLATION IN MYOCARDIAL DISEASE SECONDARY TO THYROTOXIC ADENOMAS.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Deaths after thyroidectomy	Time interval from examination until death: Shortest time	Longest time	Average time
31-40	3	2	0	2	1	0	1	0			0			
41-50	18	16	4	12	8	4	2	2			0	3 days	1 yr. 4 mos.	8 mos.
51-60	39	33	6	27	6	6	10	11			0	2½ mos.	2 yrs.	10 mos.
61-70	10	8	3	5	1	2	1	4			0	5 mos.	2 yrs. 3 mos.	1 yr. 1 mo.
71-80	1	1	0	1	0	0	0	1			0			4 days
Total	71	60	13	47	16	12	14	18	30			4 mos.	1 yr. 10 mos.	10 mos.

D-3

MYOCARDIAL DISEASE SECONDARY TO THYROTOXIC ADENOMAS —CONTROL SERIES.

Decade	Total	Patients heard from up to present time	Males	Females	Improved	Worse	Unchanged	Deaths	Per cent of cardiac deaths	Deaths other than cardiac	Time interval from examination until death: Shortest time	Longest time	Average time
31-40	3	2	0	2	2	0	0	0					
41-50	18	16	0	16	10	2	4	0					
51-60	39	35	4	31	8	9	10	8v w x y z		v Indeterminate w Carcinoma x Pneumonia y Killed z ?	2 yrs. 8 mos.	3 yrs. 7 mos.	3 yrs.
61-70	10	8	3	5	1	2	3	2			13 days	9 mos.	4½ mos.
71-80	1	1	0	1	0	0	0	1x		x Cancer			
Total	71	62	7	55	21	13	17	11 6 — 5 cardiac	8.9		1 yr. 4 mos.	2 yrs. 2 mos.	1 yr. 8 mos.

how good care they took of themselves. The tables show the gravity of this condition which is a late development in almost any heart trouble.

DR. J. W. BELL, Minneapolis: Mr. Chairman, Gentlemen: I only want to emphasize that in the last analysis, no matter what the issue, we must keep in mind definitely the condition of the myocardium. Let us have that constantly in mind, whether the heart is erratic, whether it is regular or irregular. Let us have that distinctly in mind, for in the last analysis it means how much service there is in the heart muscle.

DR. C. N. HENSEL, St. Paul: Mr. Chairman, Ladies and Gentlemen: I just want to say two things: the longevity in the heart muscle depends upon two things,—the integrity of the muscles and how the

patient takes care of it. You cannot make a blanket statement as to the disease alone without knowing how the patient will take care of it. Apparently from the tables of Dr. Willius it means heart muscle disease and innervation disease. Consequently, I want to leave the thought with you that those of you out in the country, far away from the electrocardiograph, can make the diagnosis of auricular fibrillation even there and nobody should fail. If you will count the heart over the apex and have an assistant count the pulse at the wrist for a full minute and you find a discrepancy over the beat of the heart at the wrist, having 120 over the heart and 70 at the wrist, you have auricular fibrillation and that means digitalis and if that is given the condition will improve in every instance.

DR. M. M. GHENT, St. Paul: Mr. Chaiman, Gentlemen: From the standpoint of the surgeon, I have found that one little point has helped me out more than anything else in deciding whether I can afford to operate or not. If the patient can walk up one flight of stairs without difficulty I feel that I can operate without risk, and that is the big thing so far as the heart is concerned.

DR. F. A. WILLIUS (closing): Mr Chairman, Gentlemen of the Association: I am very glad that the question of the electrocardiograph was brought up. I think that practically all cases of auricular fibrillation can be diagnosed clinically, but there is one condition in which extra systoles are so arranged that they simulate auricular fibrillation. The electrocardiograph must be used as an adjunct method of examination.

As to Dr. Rees' question: Of course, many of the patients were at the Clinic only for a day or so. In the goiter cases we are more closely associated with the patients as they remain longer and we have a better opportunity to follow up histories. There is a certain group in which we are fortunate enough to secure data from the home physician, and in at least one-half we are forced to be guided by what the patient writes. I think, however, that the tables have a distinct value because they represent a large series and the minor defects are overbalanced.

As to Dr. Hensel's statement regarding the pulse deficit in diagnosis: We have observed a great many cases, and probably one-third do not have a pulse deficit, especially those with slow rates. In these the diagnosis must be made by the variations in amplitude of the individual beats and the total arrhythemia. In my experience these factors have been more reliable than the pulse deficit.

RECENT STUDIES UPON THE THERAPEUTIC APPLICATION OF BENZYL ALCOHOL BENZYL BENZOATE AND SOME HOMOLOGOUS COMPOUUNDS*

By Arthur D. Hirschfelder, M. D.,
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We accept most of our drugs ready made by the plants, as though the plant which has not even a nerve cell had more brains than a chemist—as though the alkaloids that are formed as secretions by the plants were necessarily the ideal substances for the cure of disease. Now the plant alkaloids have big molecules which probably contain many groups that are not only unnecessary to produce the desired medicinal effect in the body, but which actually render the substance more toxic than is necessary to accomplish the purpose.

It was therefore a great step in advance when David Macht of Johns Hopkins, in 1917 attempted to determine what part of the papaverin molecule was responsible for its action. He noticed that the papaverin molecule was composed of two parts, an isoquinolin nucleus and a benzl nucleus. The benzyl group is not the same as benzol (C_6H_6) but is $C_6H_5\ CH_2$, with one free linkage. He found that the benzyl part, and not the isoquinolin part of the papaverin molecule, carried the characteristic actions of papaverin.

Pal had shown, and Macht had confirmed the observation, that papaverin has definite local anesthetic properties. Macht was able to obtain this local anesthetic action with benzyl alcohol alone—a substance far less toxic. Pal had shown that papaverine causes relaxation of the smooth muscles in the clinical conditions in which they are in spasm; and Macht has been able to obtain the same results, not only with papaverin, but with the esters of benzyl alcohol, particularly with benzyl benzoate. The great advantage of these drugs is that in the body, there are oxidized to benzoic acid, that they are thus almost devoid of toxicity, and that they cannot be habit forming.

Macht claims that benzyl alcohol is an excel-

*Presented before the Southern Minnesota Medical Association, Dec., 1919, Mankato.

lent local anesthetic and reports a large number of surgical operations that have been performed with it, using a 2 per cent solution.

At the University of Minnesota, we have repeated his observations and have found that it usually produces local anesthesia, but sometimes this anesthesia is very incomplete, and also that it frequently causes definite irritation in the subcutaneous tissues, and that injections are often followed by soreness and edema.

With the collaboration of Mr. Lundholm and Mr. Norrgaard, senior students, I have therefore tested a considerable number of substances which are chemically similar to benzyl-alcohol, in order to determine which is the best possible local anesthetic of this series. We have found that of the series thus far tested, the alcohol of the salicylic radical, that is the hydroxy benzyl alcohol, known as saligenin, which is C_6H_4 OH CH_2 OH, is by far the best. This substance is at least twice as strong a local anesthetic as benzyl alcohol, and in over thirty injections has never given any subcutaneous edema or irritation. Its toxicity is about thirty times less than that of novocaine. Until the past two weeks we have had only very small quantities of the substance at our disposal, so that we have used it in only 6 tonsillectomies performed by Drs. Clark and Camp, one tonsil being removed under novocaine anesthesia, the opposite tonsil under saligenin. The anesthesia has always been equal on both sides. In two others, done by Dr. Kenneth Phelps, the anesthesia on the saligenin side was about as good as the one on the opposite side where cocaine was used, but after the operation was over it did not last as long. Saligenin is like novocaine, and not like cocaine, in the fact that it anesthetizes on injection but does not anesthetize the mucous membranes.** Pure benzyl alcohol does this however, as Macht has shown.

In one operation for the removal of a sebaceous cyst at the angle of the jaw, the anesthesia was perfect for forty minutes, and then passed off. Saligenin is also better than benzyl alcohol in its keeping qualities, because it is a solid crystalline compound which keeps unchanged for years, while benzyl alcohol is a liquid that oxidizes spontaneously and rapidly to benzaldehyde.

Moreover, both benzyl alcohol and saligenin are quite good antiseptics and in one-half per cent strength inhibit the growth of streptococci. In view of the fact that saligenin is so non-irritating to the tissues, it is probable that this action can be put to use in the treatment of conjunctivities in surgical irrigations and dressings, and in similar conditions. The subject is now being studied under a grant from the Interdepartmental Social Hygiene Board.

Both benzyl alcohol and saligenin are vasodilators, so that adrenalin must be added to them when constriction of the arteries is desired. As regards the use of benzyl benzoate, we have had the same results as Macht, namely that both in the laboratory and in the clinic it causes relaxation of smooth muscle and gives relief in many cases of diseases in which the symptoms are due to smooth muscle spasm.

We found that the alcoholic solutions that were on the market, and in fact any mixture containing alcohol, has a very unpleasant, bitter, burning taste, but we have been able to disguise this entirely by using a new mixture, made up as follows: Pure Benzyl benzoate 10 parts, emulsion of acacia 5, Elixir eriodictyi aromaticum (National Formulary) 35,—using doses of 1 teaspoonful of the mixture, which are somewhat larger than the doses used by Macht. This is a pleasant mixture to take and will be taken by persons who refuse to take the alcoholic solutions, or any mixture containing it.

We have been able to secure relief of symptoms in a considerable number of cases of conditions caused by spasm of smooth muscle,—cardiospasm, pylorospasm, pain in gastric ulcer and hyperacidity, and we have also seen relief from aspastic constipation. The relief occurs within half an hour after taking and lasts.

We have also been able to verify Macht's observation that benzyl benzoate brings about relief in many, but by no means all, cases of bronchial asthma, just as is true of atropin or other drugs that inhibit the vagus. Still more striking results have been obtained in the treatment of dysmenorrhoea with the cooperation of Doctor Litzenberg, who will tell you in more

**Since the article was written it has been found that 10 per cent solutions of saligenin anesthetize mucous membranes, so that it can be used in cystoscopy.

detail of the results which he has obtained. About eighty per cent of the cases have had relief from pain after one to three doses. Here the great advantage of the drug lies, in the fact that they are neither toxic nor habit forming.

We are hoping soon to have enough of the corresponding products of saligenin on hand to try them out clinically, and determine how they compare with benzyl benzoate as antispasmodics—and also how saligenin compounds will act in cases of arthritis. The field seems a promising one, and we are hoping for further results.

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BLOOD TRANSFUSION: METHODS AND INDICATIONS, WITH SPECIAL REFERENCE TO THE SUSTAINING VALUE OF REPEATED BLOOD TRANSFUSIONS IN PERNICIOUS ANEMIA*

By Frederick H. K. Schaaf, M. D.
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The history of blood transfusion dates back to almost the very beginning of medical science. It was known to the physicians of old Egypt and to the priests of Apollo in Greece, and we have authentic reports of more or less successful attempts at transfusion as early as 1492. But the credit of establishing the transfusion of blood as a standard therapeutic procedure belongs to the physicians of the present century.

Today we recognize three standard methods, namely:

1. The surgical, or the artery-to-vein method, as perfected by Crile and Bernheim.

2. The syringe method, as advocated by von Ziemssen and perfected by Lindemann, Unger, Bernheim, and others.

3. The sodium citrate method, as advocated by Hustin, Lewisohn, Weil, and Agote in 1915.

Crile's direct method has been practically abandoned since the other methods have made the obliteration of vessels unnecessary. The syringe method, or any of its modifications, is still used by many physicians, but can be performed only in an operating-room and requires skilled assistance. While this method may be superior to the citrate method in a few points, it has too many disadvantages to be the method of choice. It is excelled by the sodium citrate method which has one advantage that practically offsets all points of superiority in other methods, i.e., its technic is so simple that it may be performed at any place or at any time.

In his recent article in the Journal of the A. M. A., Lindemann very unjustly ascribes to this method some of the deaths reported, but at the same time blames imperfect grouping for the production of chills and fever in 33 per cent of his first 150 cases. Wrong grouping occurred in but one of my cases; and the first 35 c. c. of blood injected produced such severe backache, dyspnoea, cyanosis, and loss of sphincter control that I can hardly believe wrong grouping is responsible for any of the ordinary reactions following transfusion. Nor do I think it advisable or necessary to transfuse as much as 1800 c. c. because of possible strain of the right heart of the patient and danger to the donor. Definite over-transfusion occurred upon two occasions in the same case: once after 750 c. c. and another time after 850 c. c. of blood had been given. The "cough symptom" recently described by Unger appeared while the patient was on the table, and continued for about two days. Definite reaction occurred in about 39 per cent of my first 100 cases, but not a single death occurred that could have been caused by the transfusion. Users of the syringe method admit reactions in from 10 to 30 per cent of the cases, and consequently at least 50 per cent of the reactions must be due to faults existing in both of these two methods. At the Mayo Clinic,

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where the citrate method is used exclusively, reactions seem to have been reduced by starving both the patient and the donor for at least six hours preceding the transfusion. This may explain to us the cases where using the same donor and the same amount of citrated blood, the patient would have a severe reaction one time and not another. Novys and De Kruif's explanation that blood outside of the body develops toxic substances within three minutes after removal from the vein may be true to a certain extent, and in some cases where transfusion was delayed, the chills and fever seem to have occurred earlier and to have been more severe but in the recent war citrated blood was kept in ice-chests for days and used without any harmful results. Anaphylaxis, agglutinins, and hemolysins, undoubtedly, cause constitutional disturbance in some instances, especially when in emergency cases we use Group 4 donors for patients in any other group.

The technic we use is as simple as possible. The donors are grouped by the Brem method, which test any physician familiar with the microscope should be able to perform. The blood is obtained from the donor through a fifteen gauge or larger needle with a short piece of rubber tubing attached, the blood being collected under constant stirring in a graduate containing 25 c. c. of 2.5 per cent sodium citrate in 0.9 per cent sodium chloride solution for every 250 c. c. of blood. As soon as the desired amount has been obtained, it is, if necessary, filtered through a piece of gauze into a cylinder and injected into the patient. The operator should be on guard for the most common danger signals, namely: generalized pains, dyspnoea, cyanosis, rapid feeble pulse, or loss of sphincter control, and in case any of these signs occur, the operation should be discontinued at once, as wrong grouping, over-filling of the right heart, or embolism may be the causative factor.

Before giving the indications for transfusion, I desire to say a few words about the length of life of a transfused blood cell. Winnifred Ashby, by an ingenious method of injecting blood cells into a patient of different grouping, proved that these cells may live as long as twenty-eight or thirty days. But, naturally, their length of life will depend entirely upon the amount of blood destruction occurring in a given case, and a certain amount of blood may sustain a patient only five days at one time and three to four weeks at another. While we know that blood does benefit by its sustaining power, we have no conclusive evidence that there is absolutely no stimulative action to the hematopoietic system. The experiments of Carnot and Deflandre proving the presence of a stimulative substance in animals bled twenty-four hours before, have suggested to me the possibility of producing a more pronounced stimulative effect by withdrawing about 300 c. c. of blood on one day and about 500 c. c on the next day. Whether or not this will be of value I am not prepared to say at this time.

Blood transfusion has been advocated in many diseases with more or less success, and its therapeutic value has been discredited unjustly, because it would not produce results which should never have been expected. We know now that it will do three things:

First: Supply blood actually lost, as in hemorrhage;

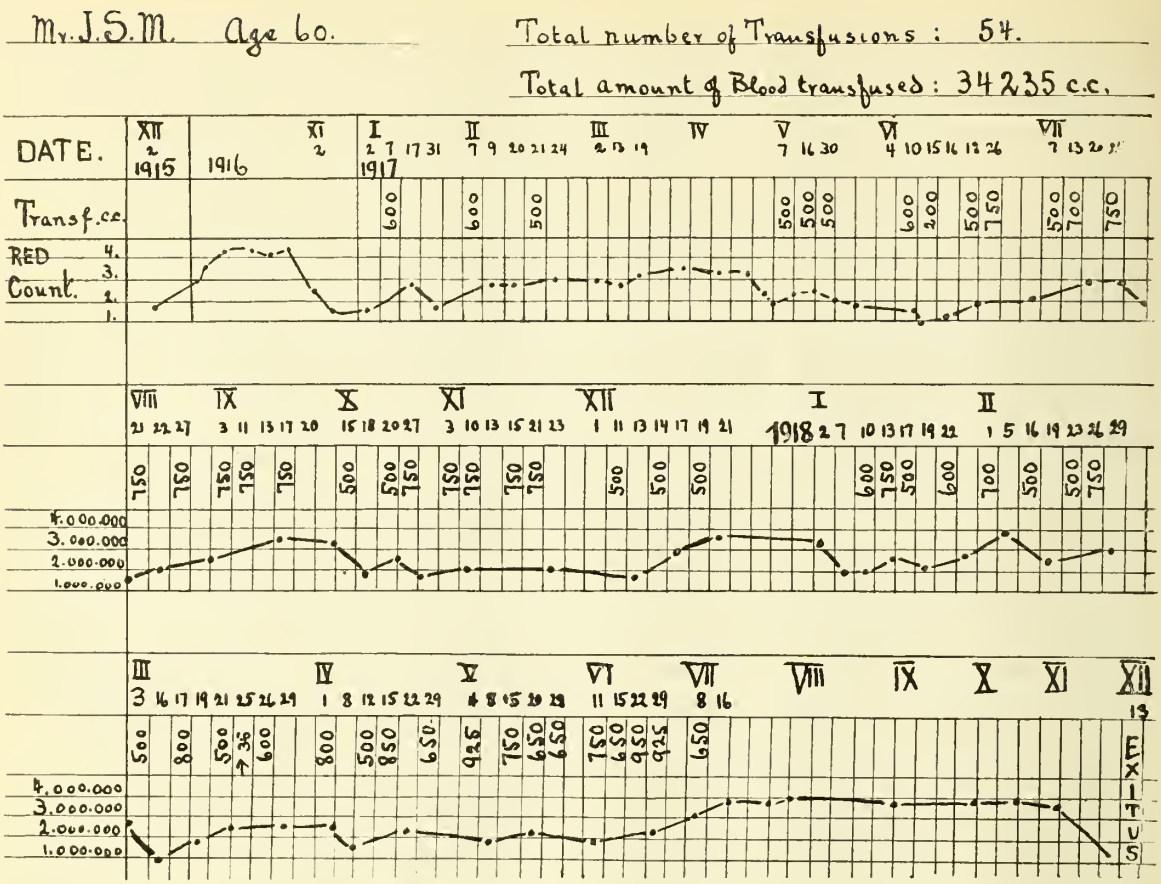
Second: Stop hemorrhage in diseases like hemophilia, purpura, and melena neonatorum by supplying both prothrombin and blood platelets;

Third: Raise the blood pressure and keep it up for a longer period than any other therapeutic measure.

We may therefore divide the indications into two groups namely:

1. Where needed as a specific therapeutic procedure in
   a. Any severe acute hemorrhage,
   b. In hemorrhagic diseases;
2. Where needed as a sustaining agent in,
   a. Pernicious anemia,
   b. Sub-acute low grade infections,
   c. Debilitated conditions due to chronic bleeding or constitutional diseases, especially before surgical interference.

That it is a life-saving measure in innumerable cases of hemorrhage has been definitely shown, especially in the recent war. It is a deplorable fact that a considerable number of patients are lost who could have been saved with a small amount of blood before or after the



operation. The value in hemorrhagic conditions may be illustrated by the results in a case of purpura hemorrhagica. As the patient had a definite history of tonsillar and tooth infection before the development of the disease, we decided to eradicate all head foci, but her bleeding time was 26 minutes, instead of 1 to 3 minutes normally. Twenty-four hours after the transfusion of 400 c. c of citrated blood, it had gone to 7 minutes, and her tonsils were removed that day without untoward results, except slight oozing for several days. At the end of five days, the bleeding time was 13 minutes, and after ten days, 17½ minutes. After another transfusion of 400 c. c. the bleeding time returned to 5½ minutes within twenty-four hours, when six badly abscessed teeth were extracted. The patient left the hospital in fine shape two weeks later with a bleeding time of 7 minutes

Most of my transfusions have been done in cases of pernicious anemia, not as a curative measure, but merely to prevent early muscular degeneration, to improve the appetite, to stop the nausea and other annoying symptoms, and to keep the patient alive until another remission occurred. To obtain this result, in some cases only one transfusion, and in others as many as forty-nine transfusions were necessary. The case I have charted is of special interest, as the patient received altogether 54 transfusions, 49 of which were necessary to produce the last definite remission, which was of about five months' duration.

That transfusion only indirectly helps to produce remissions seems probable. If we clearly understand what we can expect from this measure it will have a permanent place in the treatment of pernicious anemia until we learn to attack the disease from a different angle, and Cabot's recent prophecy that it will go down as rapidly as the blood count in these cases will not come true.

As you will be able to see from the chart, at certain periods we had to transfuse this patient every five days to keep him alive. He

was often brought to the operating-room in a comatose state, but was revived in a short time by the transfusion of a few hundred cubic centimeters of blood. That these many transfusions did not directly produce the last remission, in July, 1918, but merely kept the patient alive sufficiently long for it to occur, cannot be doubted in this case.

In severe acute streptococcic infections, I have never seen any benefit from transfusion, and advise its use only in low-grade or sub-acute infections, and in toxemias, especially, but not neeessarily, when a secondary anemia has developed, and then only as a means of increasing the patient's resistance. With this same object in view, we have used it in cases of severe secondary anemia due to ulcer, carcinoma of the stomach, and uterine fibroids, before or directly after the operation, with most excellent success. Many cases called bad surgical risks on account of the low hemoglobin and low blood pressure were thereby converted into at least fair, or even good, risks.

In conclusion, I wish to bring out and emphasize the following points:

1. That the sodium citrate method is the method of choice, especially since the percentage of reactions has been reduced and their harmlessness been proven.

2. That it is the procedure of choice in hemophilia, purpura, and melena neonatorum.

3. That blood transfusion is far superior to the injection of salt solution, where more than merely a momentary effect is desired.

4. That it will often save a case of acute or chronic bleeding, and permit surgical interference otherwise impossible.

5. That in acute cases of hemorrhage the blood pressure and not the hemoglobin estimation must be our guide to show us when transfusion is indicated.

6. That in cases of severe streptococcic infeetions transfusion is of no value, but that in low-grade, sub-acute infections, and in toxemias, it will increase the patient's resistance and help toward recovery.

7. That in pernicious anemia in a majority of cases, it will produce **immediate** general improvement and facilitate feeding by increasing the appetite and causing the disappearance of nausea and other symptoms annoying to the patient, when other therapeutic measures would require weeks to produce the same efforts.

8. That in many cases of pernicious anemia transfusion may cause a remission, but whether by direct stimulation of the bone marrow or indirectly by improving the general condition and circulation has not been decided.

9. That transfusion may have to be repeated again and again to keep the patient alive until another remission occurs.

10. That in pernicious anemia the transfusion of blood has a decidedly beneficial influence, but has no curative value whatsoever.

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DISCUSSION

DR. H. Z. GIFFIN, Rochester: Mr. Chairman, Ladies and Gentlemen: Dr. Schaaf has given us an excellent conception of his ideas concerning transfusion and I think they agree almost entirely with our experience at Rochester. It is quite certain that

the mild reactions, that is, chill, nausea, and vomiting, that follow transfusion are not due to agglutination, but to some other factor in the blood of the recipient or donor. The severe reactions that take place on the table can be recognized and the transfusion stopped. In certain cases many transfusions are necessary and the patient is carried along until he has a more or less spontaneous remission, but in the great majority of cases a definite remission begins very quickly after one or two transfusions, so that I believe that in many instances transfusion seems to initiate a remission. I believe there is a tendency to over-transfusion in some cases. Patients who present themselves in very bad condition, semicomatose, and with renal insufficiency, are likely to die rather quickly after transfusion.

The effect of transfusion on purpura is only transient. It is possible with care to operate after transfusion in a great many cases of infectious purpura and get rid of the foci.

One of the things that we see frequently following transfusion in pernicious anemia is the disappearance of nausea and vomiting, and a return of the appetite. I believe that a great deal of the improvement is due to this fact, and that it is largely a matter of nutrition. In certain cases we find it necessary to transfuse in rapid succession, giving several transfusions four and five days apart. Quicker and better results are obtained in that way.

In the acute cases of hemorrhage there is a tendency to wait to see if the blood pressure will drop and the patient will cease bleeding. There is danger, however, in waiting too long.

With respect to the experiments with starvation preceding transfusion, definite conclusions have not been reached.

It might be well to say a word of warning with respect to too great a tendency on the part of some of us to advise transfusion without deliberation. It is such an effective measure that we are apt to do this, especially in cases of secondary anemia but there is always the risk of severe reaction and of introducing a syphilitic infection, and in cases that will improve without transfusion we should not be too hasty in advising it.

DR. A. H. SANFORD, Rochester: Mr. Chairman, Members of the Society: I should like to say a few words in regard to the laboratory work in connection with transfusion. There is a tendency at present to regard this operation as very simple, especially when performed by Lewisohn's method. But, it should not be looked upon as too trival; there are dangers which must be taken into consideration. The donor must be selected by some method. It matters not whether we employ the method indicated by Dr. Schaaf, which is the one used at Rochester, or some other technic, but some procedure must be employed that will insure perfect capatibility between the donor's corpuscles and the patient's serum. In compatibility may not cause death. In weakened persons, however, and those are the ones we are transfusing, death may occur on the table when a donor of the wrong group has been used. A good surgeon will, of course, stop the transfusion if he finds a reaction is occurring after 25 or 30 c. c of blood have flowed into the patient's veins, but this is a poor method of selecting the donor.

At least five conditions are considered indications for transfusion: First, to restore blood volume after severe hemorrhages; this will not occur very often in civil practice. Second, to replace blood cells; that is, to supply healthy corpuscles to take up the function of those lost in pernicious anemia. Miss Ashbys work has shown the length of time that such transfused blood remains in the recipient. Third, to stimulate the hematopoietic system; it has been thought by many observers that this is one of the secondary effects of transfusion. Fourth, to alter coagulation factors; this can be done in bleeders, or in jaundiced patients so that the coagulation time can be brought down to the normal limit and an operation be performed. Fifth, to transfer antibodies; our own experience has been entirely negative in the attempts to use transfusion in this way, but there have been a few cases reported of the apparent transference of antibodies by this means.

Dr. J. G. Cross, Minneapolis: Mr. Chairman: Some people have stated that they have found it dangerous to transfuse at frequent intervals. I would like to know how you determine the selection of these cases for frequent transfusion. Was it because of lack of improvement immediately after the transfusion, because of some peculiarity in the case, because you were after a quick result, or was it simply experimental? I should also like to know whether in the ordinary run of pernicious anemias, taking that group alone you believe that you get better results by frequent transfusion or as is commonly done by waiting several weeks as is more commonly the practice.

Dr. H. Z. GIFFIN, Rochester (replying to Dr. Cross): Frequent transfusions are used in patients who have a very low blood count. They may be given in rapid succession several days apart and a quick response is usually obtained. Ordinary transfusions are repeated once a week or once in ten days until 4 or 5 have been given. The number of transfusions a patient should have is a question which depends on many circumstances. If improvement is not produced quickly, it is doubtful whether the treatment should be continued.

DR. J. P. SCHNEIDER, Minneapolis: The patient referred to in the paper was a man about six feet two inches tall, with wonderful vitality and wonderful will power. When he was taken with this malady he said "I have every interest in this conflict and I want to live until the war is over." He died two weeks after the armistice was signed and died be-

cause he had no good veins left and there is no question but that he was kept alive by this means. Once his son carried him into the hospital unconsicious, and the next day he ate a good meal. As time went on, before the last remission, watching his blood one would say that it was impossible for him to have any remission because the blood was made up of microcytes and macrocytes, apparently formless, and yet he had the remission in which he came down town and became active for five months. When he died he died very rapidly.

One thing this man had which we have not had before but Dr. Giffin reported it in one case. Just as soon as the hemoglobin would go to about twenty-eight, if he would turn in bed or make a sudden exertion on his feet, he would develop a typical angina. He would have to hold himself perfectly rigid and hold his breath and he thought frequently that he was going to die. He used this as the indication that he needed another transfusion. We have not seen that factor in any other case.

Another point which I think we can all derive some benefit from is this; Bernheim's work in regard to transfusion in emergency is the the best book we have. If your patients have had a terriffic hemorrhage, and the blood pressure drops to ninety systolic and remains there for several hours, you muct transfuse immediately, for even if the patient stops bleeding he will not survive. You cannot wait twelve hours. One young man bled from his esophagus terrifically. In the evening at ten o'clock his systolic blood pressure was 115, although he had bled a great deal. Owing to inability to secure a donor, the transfusion was deferred until morning. Then his blood pressure was ninety-five. He was taken to a hospital and immediately transfused with six hundred c. c. but he did not come back. He was transfused again in the afternoon but it was useless and the patient died.

DR. J. W. ANDREWS, Mankato: Mr. Chairman: Would you not feel safe after a patient had shown three successive negative Wassermann? Would you not then feel that the patient was free from this infection?

DR. C. N. HENSEL, St. Paul: Mr. Chairman: Craig has shown that two ounces of whisky will negate a Wassermann test for twenty-four or forty-eight hours. He has taken syphilitics with a positive Wassermann reaction and given them two ounces of whisky, and after twenty-four hours found a negative Wassermann. This is interesting in connection with the subject we are discussing.

DR. J. G. CROSS, Minneapolis: Mr. Chairman: After taking the most expert advice I can get, I believe the fault is largely in connection with the specimen, or the selection of the time when the blood is taken, and the test should not fall into quite so much disrepute as some of my friends would place it. If you want to be very careful about a donor, do a provocative Wassermann on him. You may be sure that in about ninety-five per cent of the cases it will show truly whether he has a positive Wassermann or not.

DR. F. SCHAAF, (closing): Mr. Chairman, Members of the Society: I fully agree that blood transfusion should not be over-done. In the Sixteenth Century it was prohibited in France except in the presence of a member of the Academy of Paris. I have been trying to limit the need of transfusion on one hand and on the other hand to emphasize its importance in some instances. I do not believe that we should use it in ordinary secondary anemia, but in conditions where secondary enemia develops, and where the patients were getting weaker and weaker, and did not have enough resistance to overcome the infection, in those cases we have seemed to have very good results. We do not intend to use it as a specific measure, but merely to help other measures for relief.

As to the reliability of the Wassermann, we have been fortunate and never yet have had a case of syphilis develop after transfusion, and in 1,500 cases in the Rochester Clinic, this occurred but twice.

CONDITIONS CONTRA-INDICATING OPERATION WITH STONE IN THE KIDNEY AND URETER*

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Methods of diagnosis and localization of renal stones have been developed to such a degree of accuracy in recent years that the percentage of error has been reduced to a minimum. When the diagnosis is established it is frequently of equal importance to determine the advisability of operation. Several circumstances should be considered before operation is recommended. Among the most important of these are: (1) Duration of symptoms; (2) size; (3) situation; (4) number of stones; (5) certain types of bilateral lithiasis; (6) low renal function; and (7) complications in other organs.

Duration of symptoms.—The duration of symptoms should be a considerable factor in determining the advisiability of immediate operation. It is not generally realized that probably 75 per cent of renal stones pass spontaneously. The majority of these stones will probably pass within three or four months following the first symptom. It may be stated, therefore, that it is

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usually inadvisable to operate for a stone in either the kidney or ureter until at least three months, and possibly six months, have elapsed since the onset of the symptoms. Immediate operation for stone following the first or second attack of pain, without evidence of other complications, is strongly to be condemned. Nature should be given full opportunity to remove the stone without intervention. There may be exceptions to this rule, of course, such as excessive pain continued over a duration of several weeks or months; evidence of acute cortical or perinephritic infection, and evidence of urinary retention sufficient to endanger the kidney. Moreover, when it is evident that the stone is too large to pass, nothing is gained by further delay even though the onset of symptoms is very recent.

Size of stones.—When the roentgenogram shows the stone to be less than 2 cm. in diameter, operation should be delayed in the hope of subsequent passage. When the stone is situated in the kidney and is less than 2 cm. in diameter, it may be very difficult to find at operation, and the search may cause considerable destruction of renal tissue. The difficulty of search is increased and consequent destruction of tissue is greater when multiple small stones are present, even though the diagnosis is evident. When the symptoms are indefinite and the identification of the shadow uncertain, immediate operation should not be considered. When the symptoms are not too severe, and there is but little evidence of renal infection, it is advisable to defer operation until the stone has increased in size.

Situation.—Stones situated in the renal cortex or in the end of the calyces as a rule cause less damage to the kidney substance, and produce less acute symptoms than stones situated in the pelvis. As a rule the urgency for operation for a stone in this situation is, therefore, not so great. When a stone is situated in the lower ureter, every opportunity should be given for spontaneous passage unless previously mentioned complications are present. Repeated x-rays, taken at intervals, which show a change in position of the stone are indicative of its early passage. When the stone is situated in the bladder portion, the possibility of its passage, naturally, is increased. Rarely is an operation indicated when a small stone is situated so as partially to protrude from the meatus.

Number of stones.—When the roentgenogram shows the existence of more than one stone in the kidney or ureter, even though they are of a size which may pass spontaneously, it is usually advisable to operate. Conditions permitting the formation of multiple stones are usually surgical, and the time elapsing before spontaneous passage of such stones may permit of considerable renal damage. If one stone is situated in the ureter and the other in the kidney pelvis, if the stone in the ureter is larger, and efforts to remove it without operation have been unavailing, removal of the ureteral stone is indicated. If the renal stone which remains is less than 2 cm. in diameter, operation should be delayed in order to give the opportunity for the stone to pass spontaneously.

Bilateral nephrolithiasis.—In the course of routine examinations stones will be found in both kidneys in approximately every sixth person suffering with renal lithiasis. Although surgical treatment is usually advisable, conditions may be such that any operation for bilateral nephrolithiasis is definitely contra-indicated. When there are no acute symptoms and when the stones in both kidneys are very large and multiple operation is usually inadvisable. Removal of such stones situated in both kidneys is usually accompanied by considerable destruction of the kidney tissue, and the chances are that the patient would live as long and as comfortably without operation. When the symptoms are acute and unilateral, however, operation is of course indicated.

Renal function.—Clinical and laboratory evidence of a very low renal function should usually contra-indicate operation when the symptoms are not very acute or persistent. Operation may be justifiable with acute symptoms, however, even though the renal function is far below the normal. It is surprising how well patients with a functional test of less than 20 per cent phenolsulphonephthalein will react following the removal of a renal stone. Furthermore, a renal function test of from 20 to 30 per cent in the presence of lithiasis, particularly when bilateral, will frequently become approximately normal after the stones have been removed. When the phenolsulphonephthalein return is only a trace, however, and the urea retention is high, operation should not

be considered unless the symptoms are urgent. Renal stone occurring with chronic nephritis is observed occasionally. The removal of such a stone will usually not affect the course of the primary nephritis and, unless the surgical indications are urgent, operation is inadvisable. Stone occurring with bilateral pyelonephritis, however, should be removed even though the symptoms are not urgent. Removal of such stones will usually have a favorable effect in that it tends to diminish the infection and further the benefit derived from pelvic lavage. It is advisable to ascertain the function of the opposite kidney before operating for renal stone, since the necessity for nephrectomy may be found on exploration. When the opposite kidney is practically functionless or when it is absent a conservative operation is necessary. Operation for stone in polycystic kidney has been done at the Mayo Clinic in 5 cases. Although operation on a polycystic kidney is usually inadvisable, acute symptoms caused by the secondary formation of stone may necessitate surgical relief. Nephrectomy is indicated only when a complicating infection has rendered the affected kidney functionless. A careful estimate of the comparative renal function is indispensable in cases of polycystic kidney. When glycosuria is present, the same precautions should be observed which are necessary in surgery in any other portion of the body, that is, the reduction of sugar by dietary and other means, and operation only when absolutely necessary.

Coincident disease.—Lesions in other organs are frequently noted coincident with renal lithiasis and they may influence the advisability of operation. The presence of a coincident lesion may bring up the question of which lesion should have precedence in treatment. When the several conditions are surgical the lesion which causes the most acute symptoms naturally necessitates operation first. Among the long list of coincident disease, lesions in the alimentary tract and renal lithiasis are the most common. Surgical lesions in the gallbladder, appendix, and duodenum coincident with renal lithiasis occurred in more than 10 per cent of the patients operated on in the Mayo Clinic. The coincident lesion may be such that operation on the kidney should be postponed or even permanently contra-indicated. Certain forms of cardiac disease, when advanced, may render such an operation inadvisable even though no evidence of decompensation may be present at the time. This is particularly true in the aged. It is not to be inferred, however, that cardiac lesions which are well compensated or of moderate degree will offer any contra-indication to renal operation.

Hypertrophy of the prostate gland coincident with renal lithiasis is occasionally observed. In cases in which most of the symptoms are caused by the prostatic obstruction, prostatectomy is indicated after the usual course of preparation, provided that the other kidney is normal. When the renal symptoms are so acute as to require primary operation the degree of urinary retention is of considerable importance. When a large amount of residual urine is present a preliminary drainage and its usual reaction should precede the renal operation if possible.

Pregnancy, particularly of less than six months, offers no contra-indication to operation. If the symptoms become acute and persistent it may be necessary to operate as an emergency measure even in the later months. As a rule, however, in the latter period of pregnancy it is advisable to defer any operation. Unilateral lithiasis should not cause any serious complication during the course of pregnancy or labor. With bilateral nephrolithiasis, however, renal insufficiency may interfere to such an extent that induced labor may be necessary.

During the years 1917 and 1918, 79 cases were diagnosed renal lithiasis at the clinic in which operation was not advised. In this group the various causes assigned were as follows:

	Cases
Operation deferred because of indefinite diagnosis either from clinical of roentgenographic and cystoscopic data	43
Lesion of the central nervous system	2
Advanced pregnancy	2
Bilateral nephrolithiasis with evidence of uremia	3
Hypertrophy of the prostate with renal insufficiency	3
Excessive adiposis with indefinite symptoms	1
Advanced age	2
Advanced malignancy in other tissues	2

Advanced disease in the other kidney; renal insufficiency	1
Advanced bilateral pyelonephritis	2
Advanced cardiac disease	6
Chronic nephritis	2
Hypernephroma of the opposite kidney	1
Bilateral nephrolithiasis with pregnancy	1
Myocardial disease and goiter	1
Active lues	2
Advanced diabetes	1
Bilateral pyonephrosis	1
Single kidney with indefinite shadow	1
Active bilateral pulmonary tuberculosis	1
Polycystic kidney with renal insufficiency	1
Advanced Hodgkin's disease	1

From this it may be inferred that the diagnosis of renal stone may be of secondary importance in the clinical summary, and that the conditions which may contra-indicate lithotomy are many.

Stone in the ureter.—In recent years numerous articles have appeared with reference to the removal of stones in the lower ureter by nonoperative methods. Some authors in their enthusiasm claim that it is no longer necessary to operate for ureteral stones since they can all be removed by cystoscopic manipulation. In a previous article I reviewed the methods employed to remove stones in the lower ureter and reported 64 cases in which the stone had been successfully removed. Since then we have been able to bring about the passage of stones in 62 more patients, or in 126 in all. It has been our experience that approximately half of the stones in the lower ureter that will not pass spontaneously can be removed successfully by nonoperative measures. This proportion will be greater in larger communities in which the more acute cases with histories of recent symptoms may be observed by the surgeon. In a large number of these early cases small stones would probably have passed spontaneously even though no cystoscopic manipulation had been made. When the stone has been lodged in the lower ureter during a period of more than from three to six months, and when it is more than 2 cm. in diameter, the possibility of its dislodgement by cystoscopic methods is greatly diminished. In justice to the patient, however, an attempt should be made in every case to dislodge the stone before resorting to operation. It is frequently surprising that by simply dislodging a stone which has been causing symptoms over many months it will be passed by the patient with the next colic. Recent observers have given much importance to the value of drugs which cause the ureter temporarily to relax. It is very questionable, however, what bearing such temporary relaxation could have. Of greater importance is the fact that the stone has been removed from its anchorage by the ureteral catheter, dilating sound, or instrument which has come in contact with it. Definite contra-indication to further attempts to dislodge the stone, however, may be as follows: (1) a stone more then 2 cm. in diameter; (2) acute impaction with continuous obstruction; (3) acute renal infection; (4) intolerance on the part of the patient to the cystoscope, and (5) anatomic deformity.

In conclusion I would emphasize the facts that the great maority of renal and ureteral stones will pass spontaneously, that a large proportion of stones in the lower ureter which do not pass after one or two attacks of colic can be dislodged by cystoscopic manipulation, and that immediate operation for small stones, which have caused recent symptoms, is seldom justifiable.

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Discussion on the paper of Dr. W. F. Braasch

DISCUSSION

DR. GILBERT J. THOMAS, Minneapolis: There are just a few points I wish to emphasize in Dr. Braasch's excellent paper.

First, the absence of symptoms with stone in the kidney. I have frequently seen cases of bilateral stones in the kidneys that caused no symptoms. In making a roentgenographic examination for other conditions one frequently finds suspicious shadows which later by cystoscopic methods are found to be stones in the kidney pelvis or within the kidney substance. Such lesions may cause no symptoms. During my service at the Mayo Clinic I observed a case of nontraumatic rupture of the kidney in which the kidney contained a large stone. This lesion was of long duration and the man had had no symptoms.

The reason we so frequently miss the diagnosis of multiple stones in the kidneys and ureters, is because the suspected side only, is rayed and complete Cystoscopic data is not obtained. In my opinion the technique for roentgenography of the urinary tract should always include roentgenograms of both kidneys and ureters together with the bladder.

The second point I wish to emphasize is the contraindication to operation for small stones in the ureter or kidney. Frequently surgeons have explored for small stones demonstrated in the roentgenogram or by the cystoscope and have been unable to find them at operation, the stones having passed into the

bladder, or if originally lodged in the ureter, they may pass back into the kidney pelvis.

A large proportion of the stones found in the ureter can be removed or, at least, their passage through the ureter and into the bladder can be assisted by the introduction of ureteral catheters or dilators. The introduction of papaverin into the ureter or subcutaneously is of assistance in some cases. Large doses of morphine are not as good as papaverin. In my opinion, surgery should not be attempted until cystoscopic methods have been tried. If one is sure the stone cannot pass or definite damage is being done the kidney surgery should be advised at once.

The third point I wish to call to your attention is the necessity of complete Urologic examination when a lesion is suspected in the urinary tract. The contraindications that Dr. Braasch has told us about were observed only after complete and careful examination.

Very often in making a diagnosis of stone or other lesion in one kidney or ureter, the organs on the other side are not explored by the ureteral catheter and their function is not estimated. This is of course necessary before considering any operation on the urinary tract, as many times one will find a contraindication to surgical intervention which might have been overlooked if a complete examination had not been made.

In many cases of hypertrophy of the prostate the surgeon forgets to cystoscope the case or to make a complete roentgenogram of the kidneys, ureters and bladder. Operation for the removal of the prostate might be contraindicated when complicated by stone in the kidney. Certainly the prognosis in such cases could be more accurately stated if the exact condition of both kidneys is known. The cystoscope will frequently reveal a relaxed bladder outlet in patients that have all the symptoms of hypertrophy of the prostate.

THE USE OF THE THOMAS BED KNEE SPLINT FOR THE ROUTINE TREATMENT OF FRACTURE OF THE SHAFT OF THE FEMUR*

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The Thomas Bed Knee Splint has been used since its invention over fifty years ago for the treatment of fractures of the femur, but it has only been since the Great War brought this splint into prominence that the greater part of the medical profession in the United States has heard of it. Even now it is considered by many as only a first aid or transportation splint and therefore to urge its more common use in fractures of the femur in civil practice seems justifiable at this time. The splint is not used to the best advantage in sub- or trans-trochantric fractures for these, like fractures of the neck of the femur usually require more or less complete abduction in order to obtain the best results. Of course there are at times certain cases with complications, such as injury and swelling around the groin and perineum, which make necessary some other type of treatment, but it will be found that these are not common if the Thomas splint is understood and its application and adjustment properly performed. To accomplish this however, the underlying principles of the splint must be thoroughly known and rigidly applied.

"Fixed extension" or the use of fixative energy in the treatment of fractures of the long bones has long been a well understood principle, but has probably not been used as often, or by as many men as the principle of "continuous" or "elastic traction" as commonly applied by means of the weight and pulley. With this latter there is a continuous force tending to pull the fragments apart, acting constantly by the application of the force of gravity. There is no fixative force applied except that the same force of gravity results in the patient's body being kept in bed and not pulled onto the floor. This fixative force is not so great but that it is more or less easily overcome by movements of the patient, which movements result in sudden variations in the ratio between it and the constant force applied through the weights. This means that there can be no absolute fixation of a fracture where weight and pulley are alone used and that the variations in tension referred to must cause more pain and discomfort to the patient than would be the case if a definite fixative force were applied.

It is a well known physiological law that nature tends to protect an injured or inflamed area by causing the muscles around or over this area to become hypertonic and thus to act as guards over accidental movement of the parts involved. This is seen, for example, in the rigid abdominal wall of acute peritoneal infections, in the "muscle spasm" of tuberculous or more acutely inflamed joints, and in the rigidity around a fractured bone. This condition is largely reflex and the afferent impulses are due to irritation at the site of the lesion; in fractures movements of the fragments. It can be readily understood from this why it is sometimes necessary to increase

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the amount of weight attached to a leg to twenty-five or even more pounds before the muscles finally give up and become relaxed. The reflex arc, or the nerve-muscle system, is stimulated by the movements of the patient and "starting pains" are the result and it is only by this increase in the constant force that the desired results are obtained. Of course even then movements such as are necessary in the nursing of the case, may cause sudden reflex contractions and therefore pain.

Fixative force, in contrast to constant or continuous force, is that which will hold the fragments of a fracture in the same relation to each other at all times regardless of movement of the patient or involved limb. There is no attempt made to keep a constantly extending force on the muscles, but they are merely prevented from contracting after being pulled to the desired length. The use of this fixative force is the underlying principle in bone plating, the so-called external bone plating, plaster of Paris dressings and the Thomas splint. With external bone plates the fixed points are where the pins go through the fragments and these are held stationary in relation to each other by the external clamp. With plaster of Paris the fixed points are the various places on the surface of the body to which the plaster is molded on application, while the constant relationship of parts is assured by the hardness and inelasticity of the plaster. The Thomas splint uses the tuberosity of the ischium as one fixed point and the bottom of the splint as the other, these points being joined by the unyielding side bars of the splint. The traction on the distal fragment is obtained through the skin by means of adhesive plaster or glue and the traction straps are tied down to the end of the splint, which point, as we have just seen, can not slide upward. The force or energy acting at the site of fracture is therefore definitely fixed.

The Thomas splint consists of two lateral bars, made from a single length of heavy iron wire (1 centimeter) bent upon itself in the center, which terminate at the upper end in a well padded ring covered with smooth leather fitting around the thigh, this ring being attached so as to form an angle of 120 to 135 degrees with the inner bar. The ring is the most important feature of the splint and many failures in the use of the latter are due directly to the former being incorrectly designed. In order to keep the ring constantly against the tuberosity of the ischium and to prevent it from resting on or slipping across the perineum it must be of the right size both as regards circumference and the thickness of the padding. If the circumference is about four centimeters greater than the horizontal circumference of the thigh at the level of the groin it will not constrict the thigh nor irritate the area over the greater trochanter. A ring large enough to allow the fingers to be passed between it and the lateral surface of the hip is satisfactory, but larger rings may need a soft pad placed here to prevent slipping. The ring where it rests on the tuber-ischium and passes around the groin should never exceed three and one-half centimeters in a diameter, as thicker rings cannot be fixed securely. The shape of the ring is also of importance and one should not confuse the bed splint in this particular with the walking splint. The bed splint is symmetrical and can be used for either side while the ring of the walking splint slants posteriorly and curves so as to fit the buttock more accurately and consequently must be made in rights and lefts. The bed splint ring is slightly avoid or egg shaped, the center of the larger or more rounded side being attached to the inner bar. The side bars should be 15-20 cm. longer than the limb.

The application of the splint is simple. The surgeon must also apply, however, his knowledge of physiology and remember that sudden movements at the site of the fracture and also sudden changes in the tension of a muscle, initiate impulses which cause contractions and therefore pain. With this in mind, a gentle but firm traction in the line of the axis of the limb will cause the muscles to relax, at least partially, and allow the splint to be applied without the need of an anesthetic.

After shaving the limb, extension straps of adhesive plaster are applied, or if desired, glue extension with or without preliminary shaving may be used. If adhesive plaster is used, it is applied in the same manner as for a Buck's extension except that the lower ends instead of being attached to a spreader or block of wood are sewn onto webbing straps or loops and left free.

The plaster should run a short distance above the site of fracture if it is not compounded. Spiral adhesive straps may be used for additional security and then the whole limb is wrapped with a roller bandage to hold the adhesive firmly to the skin, but care should be taken to avoid constriction. Of course the straps do not run over the malleoli, but leave the skin two to three centimeters above the ankle, the bandage passing under them here and encircling the ankle a few times.

Glue extension will also be found very satisfactory and is easily applied. There are several types of glue used, Sinclair's and the so-called resin and turpentine glue being the best known. The former consists of equal parts of cabinetmakers' glue and water with the addition of small amounts of glycerine, calcium chloride and thymol, while the latter contains equal amounts of resin, alcohol and benzine with one-thirtieth part of Venice turpentine. Sinclair's glue needs to be liquified in a water bath before use. In order to remove all oil from the skin, sodium bicarbonate solution and ether should be used. The glue, either type is then painted unto the skin with a brush and extension straps of flannel, folded gauze, or unbleached muslin are applied and held in place with a roller bandage, the same precautions being observed as when using adhesive plaster. The straps should be long enough to extend at least one-half a meter below the foot.

The extension straps of whatever variety having been applied, a nurse or assistant exerting traction on the limb while this is being done, the splint is then slipped over the foot and leg until the ring fits snugly against the tuberosity of the ischium, the side bars lying in the same horizontal plane. The extension straps are then passed one over, and the other under their respective side bar, pulled tight, and brought together and tied at the notch in the bottom-cross bar of the splint.

A screw attachment, fastened unto the bottom of the splint, may be used to tighten the straps if desired.

With a recent fracture it is usually possible to pull the limb down to within one or two centimeters of its normal length at this primary application. Frequently the normal length may be obtained.

A long, posterior, gutter shaped splint is then applied to the thigh and leg running to just below the calf. This is well padded so that the normal anterior bowing of the femur is obtained and also slight flexion at the knee joint, as hyperextension is often very painful. This splint is held in position by slings of muslin or flannel running between the side bars of the splint so that the limb is lying in a trough. The slings should be tight enough to keep the side bars running approximately along the midline of the lateral surfaces of the limb. Frequently the posterior splint need not be used, the position of the fragments and the anterior bowing of the femur being retained by the slings themselves. Coaptation splints can now be applied to the anterior surface of the thigh if necessary, and held in place by circular ties of bandages or by ties passing under the side bars and back over the anterior surface. A foot piece should be clamped onto the splints to keep the foot at a right angle and then the entire apparatus from ankle to groin may be wrapped with a muslin or gauze bandage. If care has been taken to see that the ring of the splint is fitting snugly against the tuberosity of the ischium there can now be no motion at the site of fracture.

As a direct result of this the muscles soon become quiescent and relaxed and the patient can move his body or even sit up in bed without altering this condition.

Examination will show that not only the muscles running across the site of fracture are relaxed, but all the muscles of the extremity are flaccid. For this reason it will readily be seen that the use of special positions and apparatus for supracondylar or high shaft fractures is unnecessary as the tendency to deformity disappears when the muscles relax.

A rest to hold the end of the splint off of the bed is used to keep pressure from the patient's heel or the splint may be slung from an overhead frame so as to allow greater freedom of movement in bed.

Within a short time, twelve to eighteen hours, after the primary application of the splint the traction straps will be found to have loosened up due, not to their slipping or stretching, except to a very slight degree, but to the relaxation of the muscles. The slack is

taken up and measurements will show that a gain has been made in the length of the limb. After having done this several times during the first few days one will be surprised to find that the extremity is longer than normal. One to one and one-half centimeters difference in this direction is desirable and when this is obtained the future treatment consists merely in holding it. The tape measure must be used daily as a check and the adjustment of the splint kept perfect. No day should pass without the surgeon satisfying himself that everything is as it should be both as to length and to the position of the fragments, posterior bowing being particularly guarded against.

Patients can be taken easily and without pain to the x-ray room for roentgenographic examination if desired and, unless a metal posterior splint has been used both antero-posterior and lateral views obtained.

This examination is not absolutely necessary, however, for if one has pulled the limb to the required length and has been careful to preserve the normal anterior bowing of the femur there can be no question of malposition as the fragments must be, from the nature of the splint, in correct alignment. This does not mean that perfect end to end approximation of the fragment has been obtained for such accurate anatomical reposition is not necessary if the length and alignment are correct.

Compound fractures are handled in the same way as simple fractures the supporting slings being adjusted so as to allow easy access to the wounds.

In old mal-united fractures with several centimeters shortening it is necessary first to refracture, either by open incision or manipulation, but after that the case is treated as outlined above. While the case is still under the anesthetic it is often best, especially if there has been marked shortening to stretch the structures by forcible traction with a block and tackle before applying the splint and in this way save much time in getting the limb to the required length.

The nursing of all cases wearing the Thomas splint is of great importance and nurses should be carefully instructed in their handling. The pressure on the skin over the tuberosity of the ischium can be relieved by changing the position of the limb in bed, that is, by abducting or raising or lowering, and the skin surface should be frequently changed by pulling new areas under the ring. Of course it is of primary importance that the skin be kept clean and dry.

The after treatment is not different from that when other methods are used, but one must remember that early weight bearing is to be avoided on account of the yet moldable callus. This is best controlled by use of the caliper splint which is merely a Thomas splint cut off and turned into a socket made in the heel of the shoe. The splint should be about one and one-half centimeters longer than the extremity so that most of the weight will be supported by the splint resting upon the tuberosity of the ischium and not by the recently united femur. The walking ring was designed for this use but the bed splint is absolutely satisfactory when altered for the purpose.

The knee must be bent as soon as it is safe to release the traction straps long enough to allow this motion and if this is done daily during convalescence there is no delay in obtaining the full degree of flexion. Most of the painful and stiffened knee joints resulting from simple fractures of the femur, regardless of the method of treatment which has been followed, are due to prolonged fixation in hyperextension and if care is taken to keep a sufficient amount of padding under the knees to hold them in slight flexion this disabling complication will be prevented in practically all cases.

SUMMARY

1. Fixed extension is superior to the weight and pulley in the treatment of fractures of the shaft of the femur.

2. The Thomas Bed Knee Splint is the method of choice for the routine treatment of these fractures.

3. The splint must be of the proper design to be efficient and any alteration or modification detracts from this efficiency.

4. The tape measure must be the criterion as to whether traction has been strong enough.

5. The splint can not work alone. Frequent adjustments and intelligent handling are necessary.

6. The use of the caliper splint during convalescence will prevent late shortening caused by giving of the callus.

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EDITORIAL

INFLUENZA IN MINNESOTA

Tables which have been compiled by the Minnesota State Board of Health show deaths by years from influenza as follows, during the past decade:

Year	Deaths
1910	75
1911	151
1912	85
1913	184
1914	122
1915	258
1916	499
1917	257
1918	7,521
1919	2,581
Total	11,733

For the first time an opportunity is given to compare the totals by months. The deaths from influenza for 1917 are given for purposes of comparison.

	1917	1918	1919
January	98	15	1,012
February	56	15	431
March	33	13	609
April	24	55	295
May	16	27	109
June	5	6	38
July	0	4	17
August	0	4	19
September	1	7	14
October	7	2,105	10
November	4	3,260	5
Deeember	13	2,010	22
	257	7,521	2,581

A study of the above table shows many interesting features. During 1919 a slight epidemic of influenza or grippe occurred in April as is evideneed by the 499 deaths from this disease that month, but the number of deaths from influenza each month was greater than the year before. In October the deaths from the great pandemic began and in the last three months of the year totaled 7,375. The situation improved in January of 1919 and throughout the year, with the exeeption of a slight spurt in Mareh, the deaths from influenza beeame fewer and fewer until November saw the wave over. The total number of deaths from influenza in the State of Minnesota during the epidemic of 1918-1919, thirteen months of Oetober to Oetober inelusive, was 9,929. Of this number 264 were expected from the average annual mortality from this disease during the previous five years.

It is noticeable in 1918 that as the deaths from influenza increased, the deaths from other causes did not fall off. The expected mortality from all causes for this year was 24,156, the actual mortality 31,380. If the 7,257 unexpected influenza deaths (7,521 less 264) be added to the expected mortality for this year the figure as obtained is almost the same as the actual mortality.

In 1919 the same eondition did not prevail, the expeeted mortality was 24,495 and the actual mortality 24,874. The 2,581 influenza deaths eaused a diminution of 1,938 over the expeeted deaths from other causes. [(24,874—2,581)—(24,495—264)=1,938].

A strange phase little thought of is the birth table:

	1917	1918	1919
January	4,633	4,473	4,171
February	4,374	4,526	4,070
Mareh	5,045	5,290	4,839
April	4,507	4,947	4,596
May	4,402	4,789	4,422
June	4,493	4,626	4,114

July	4,905	4,921	4,116
August	4,838	4,718	3,903
September	4,544	4,717	4,081
October	4,450	4,624	4,405
November	4,290	4,212	4,334
December	4,447	4,030	4,640
	54,928	55,873	51,691

Attention is particularly called to the reduction in the number of births occurring during the epidemic wave. This reduction first began to be felt in December of 1918 and continued until November of 1919, being felt particularly the months of August and September of 1919. There are certain factors which must be considered in any attempt to account for this reduction:

1. A large per cent of the total number of deaths from influenza were among women of childbearing age.
2. The absence of males at war.
3. The high cost of living.

Note that 106,407 white and 511 colored men were sent by Minnesota to war, but that exemption was allowed by draft boards on account of dependency of wife very frequently. The decline of 4,000 births in 1919 over 1918 and the complexity of the situation causing this reduction is entitled to serious study.

C. E. S.

GENERAL GORGAS

The name of Major General William Crawford Gorgas whose death occurred on July 4th will ever be associated in history with the successful building of the Panama Canal. The triumph of preventive medicine under his jurisdiction, evinced in the control of malaria and the eradication of bubonic plague and particularly yellow fever, was an essential to the completion of the enormous task of building the canal. Where previously one and two out of every three of the inhabitants of the canal zone succumbed to yellow fever, and malaria incapacitated so large a percentage of the workers, his industry and executive ability succeeded in instituting living conditions which compare favorably with those of any health resort.

He was an officer in that branch of the army, the principal concern of which has come to be the combating of microscopic and ultramicroscopic foes. In a perpetual state of war, bravery, though less dramatic, was an essential and often more praiseworthy. Numerous Americans made their names memorable in the fight against these tropical diseases and the supreme sacrifice was required of such men as Reed, Carroll and Lazear.

It is exceptional for an individual to acquire world fame. The pranks of destiny many times seem to be the controlling factors. Nevertheless, industry and preparedness to step in when opportunity presents itself, are essential requisites and argue against too fatalistic a philosophy of life. In our country too, opportunity more often singles out a man solely on account of his individual merit.

These various factors all played a part in the career of General Gorgas. The son of a Confederate general, the end of the Civil War found him a destitute boy dependent on friends in Baltimore. Immediately after taking his medical degree at Bellevue Medical College in New York, he entered the army and in an early assignment contracted yellow fever. Perhaps this intimate experience with the disease directed his attention to it in his later life.

In 1901 under General Wood he eliminated yellow fever from Havana within the year. His success in this undertaking resulted in his appointment as chief sanitary officer of Panama in 1904 and his supervision of the extensive sanitary operations throughout the canal zone which required primarily administrative ability, medical conviction and attention to detail, miraculously cut down the ravages of disease. His weapons were largely the ash can and wick which continually dripped the larvacide upon the surface of pools and streams. The use of mosquito netting and general sanitary measures completed the trick.

At the request of the British government General Gorgas, in 1911, made an inspection of the Rand mines in South Africa and put his experience at the disposal of that government in combating the high pneumonia prevalence.

As surgeon general of the army from 1914 until his retirement which period included our participation in the World War a record for low disease mortality was attained which had

previously been held by the Japanese in their war with Russia.

Following his retirement from the army, not being content to remain idle, the General personally conducted a sanitation enterprise in Ecuador as a Director of the International Health Board of the Rockefeller Foundation. This was brought to a successful close last October.

It can be said without fear of contradiction that the activities of this man saved the lives of thousands of his fellow beings. He will ever be an inspiration to his brothers in the medical profession.

MEDICAL MEETINGS

The mid-summer meeting of the Southern Minnesota Medical Association was a success from start to finish. The scientific program was run off in twenty-four hours which afforded no time for delay and the association maintained its reputation for having plenty of snap. A large number of the visiting physicians were cared for by the citizens of Fairmont and cared for in such a way that the paucity of hotel accommodations proved an advantage to the visitors. Much might be said of the poor roads in Minnesota and particularly in the southern part of the state. Inclement weather makes them absolutely unreliable. Railroad accommodations, while more reliable, were most inconvenient. Perhaps these are sufficient reasons for the failure of certain celebrities to make their appearance at the Fairmont meeting. It is quite remarkable that the actual program of any association of physicians bears any resemblance to the one originally planned. The social aspect of the meeting made it possible to derive still greater pleasure from the meeting.

The annual meeting of the Minnesota State Medical Association is scheduled for September 29, 30th and October 1st, 1920, in St. Paul. This is the largest meeting in the State and is the one most generally attended by physicians. This will be an unequaled opportunity for the exchange of ideas and for keeping in touch with the progress of our profession.

MINNESOTA PUBLIC HEALTH ASSOCIATION COLUMN

Ey Dr. H. W. Hill, Exec. Sec. M. P. H. A. Shubert Building, St. Paul, Minn.

"TRENCH WORK NEXT JANUARY"

What Public Health action is needed in Minnesota from the coming Legislature? Also, and very emphatically, what is NOT needed?

What we need, in all its details, has not yet been fully developed in form for presentation—a State-wide committee is in process of construction with this end in view.

But we already do know at least that Minnesota needs: (a) more Tuberculosis Sanatoria, in counties not yet provided; (b) increase in capacity of the existing Sanatoria; (c) the union of certain counties, now unprovided, with counties already provided. Of these three items we have no doubt. Also we already do know that Minnesota does NOT need any supervision or remodelling of its public health laws by Christian Scientists, who attempt this with the greatest persistence, although without success, last year. We must assume that they will repeat.

An active organization in California is seeking $25,000—a mere bagatelle for Christian Scientists to spend on their own peculiar religio-medical propagandum—avowedly to restrain development of public health work in the California schools; deliberately to prevent care of tuberculosis and other infectious diseases by modern methods.

In Colorado a similar anti-public health Christian Science movement is already well developed. It is hardly to be expected that energetic Minnesotans of this peculiar brand will allow the tenets of their church to be neglected here. Nor are their efforts directed merely at the fringes of things. During the last regular Minnesota legislative session they introduced a bill doing away with the right of the health officer to make entry and search in case of suspected contagious disease—thus cutting out the very heart of the Health Officer's duties and powers.

The legislative program must be both aggressive and wary—it must seek definitely modern public health goals and at the same time guard against reactionary Bolshevik religio-medical sectarianism. It must be carried on by the Public for it is the Public that need it and are benefited by it.

But the Medical Profession should be posted, should consider and approve or disapprove—and while taking no active part in the legislation, it should watch, ready to support by moral strength and scientific prestige, the efforts of those who will actually "go into the trenches" during the coming campaign.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

The annual meeting of the Minnesota State Medical Association will be held in St. Paul, Wednesday, Thursday and Friday, September 29th, 30th and October 1st, 1920. Dr. Harry B. Zimmerman, Lowry Bldg., St. Paul, is Secretary of the Surgical Section and Dr. E. L. Gardner, La Salle Bldg., Minneapolis, is Secretay of the Medical Section. Dr. W. W. Lewis, Lowry Bldg., St. Paul, is chairman of the local committee of arrangements appointed by the Ramsey County Medical Society.

MEDICAL ASSOCIATION OF MONTANA

The Medical Association of Montana held its forty-second annual meeting July 14th and 15th, 1920, in Helena. Following are the officers of the association: Dr. F. M. Larson, Great Falls, President; D. L. Stevens, Laurel, First Vice-President; Dr. P. H. McCarthy, Butte, Second Vice-President; Dr. A. W. Deal, Lewistown, Third Vice-President; Dr. E. G. Balsam, Billings, Secretary-Treasurer.

WABASHA COUNTY MEDICAL SOCIETY

The fifty-second annual meeting of the Wabasha County Medical Society was held July 8th, 1920, in Zumbro Falls, Minnesota. Papers were read by Drs. Slocumb, Plainview; Dr. H. E. Bowers, Lake City, and Dr. Verne C. Hunt, Rochester. Dr. W. F. Wilson, Lake City, is Secretary of the Society.

OBITUARY

DR. E. E. WELLS

Dr. E. E. Wells, county physician and poor commissioner of Washington County and one of the leading physicians of Stillwater, Minn., died in May from pneumonia. Dr. Wells was born Dec. 8th, 1870, in Rockford, Ill. He came to Stillwater about twenty-one years ago. He is survived by his widow, two daughters and a sister.

DR. CARL J. RINGNELL

Dr. Carl J. Ringnell died in Minneapolis, June 9th, at the age of fifty-six years. He was born at Visefjerda, Swedcn, June 3, 1864. He came to America when 18 years old and entered Gustavus Adolphus College; after completing his course he entered the University of Minnesota. He was one of the founders of the Swedish Hospital of Minneapolis. He is survived by his widow, one daughter, his aged father and four brothers.

DR. JOHN WARREN LITTLE

The unexpected death in June of Dr. John Warren Little, of Minneapolis, came as a great shock to his many friends and patients. Born sixty years ago in South Charleston, O., Dr. Little spent the early years of his life there, receiving his preliminary education in its public schools and at Lebanon College.

His medical course was taken at Jefferson Medical College, from which institution he graduated in 1883. Surgical work appealed to him from the first and it was natural that his desire to become a surgeon should have received inspiration from that greatest of surgical teachers of his time, the elder Gross, who was then the professor of surgery at Jefferson.

Coming at once to Minneapolis he entered general practice. Medical cases naturally came first to a young man without hospital or other training in surgery, but he never neglected a surgical opportunity, and the slow rate of his early progress never discouraged him nor abated his enthusiasm in that direction. Early in his career he adopted the practice, common now but much less so then, of making frequent visits to the clinics of noted surgeons, and it always gave him pleasure to acknowledge his indebtedness to these men for any of their methods or points in technic which he afterwards adopted in his own work.

Recognition of his ability brought him positions upon the surgical staffs of the local hospitals and he has served, either in an active or honorary capacity on most of them. For several years he was a member of the University of Minnesota Medical School faculty, teaching clinical surgery.

It was not until fourteen years ago that he announced himself as limiting his practice to general surgery. By this time he had built up a large family practice, and through this had acquired a broad knowledge of general medicine. This, taken with his long training in the school of experience and a natural aptitude for surgical work, combined with a fund of good common sense and judgment, with which nature had generously endowed him, soon placed him in the front rank of his speciality.

His honesty of purpose to do the best thing possible for each patient and to do it well influenced many of the doctors of the Northwest to send him their surgical cases, for they knew they would have no excuses to make for their choice of consultant and operator.

Ten years ago, believing that the welfare of his patients would be materially enhanced by having a place to put them, where the ordinary objections made to hospitals could be eliminated, he, with two or three friends established Hill Crest Hospital.

His hopes in this direction were largely realized and this institution became very dear to him. Many a time the writer has heard him say on his return from a trip or vacation, that he got more real enjoyment out of his work in the wards and operating

room of the hospital than from any vacation he ever took.

The reputation of the hospital he cherished as his own, and he greatly appreciated the efforts of all those who worked for its interests.

Dr. Little was very loyal to his profession and proud to have been a member of it. He gave liberally of his time and money to anything which he felt would advance its interests.

He was a member of all the local medical societies, and has been president of the Minnesota Academy of Medicine, the Hennepin County Medical Society, and the Minnesota State Medical Association. He was also a member of the American Medical Association and a charter member of the American College of Surgeons.

When the war with Germany was declared, it was a great disappointment to him that the age limitation kept him from getting into active service. He immediately joined the volunteer medical service and did his bit in the examination of the drafted men and in services rendered as a member of the state committee of the Council of National Defense.

He had a host of friends and they came from all ranks in life. He was a good mixer and could put himself en rapport with one end of the social scale as well as with the other. He never side-stepped a reasonable request to do a friend a favor; was warm hearted and generous and his charities were not all registered on subscription lists, but were as often individually bestowed from personal knowledge of their need—many a man in Minneapolis has received from him financial aid in time of stress or has secured work through the direct solicitation of the doctor.

He had a deep sense of humor and a large fund of anecdotes and stories making him a delightful companion on a trip or in a leisure hour. Some of his stories told in the Swedish dialect or Irish brogue were inimitable. He was very fond of poetry and the poems of J. Whitcomb Riley were his special favorites. He knew most of them by heart and would quote from them frequently to adorn a tale or illustrate a point.

For a few days before his death, he realized that his sickness might prove fatal, but he continued to fight for life until the end.

This was characteristic of the man never to give up while life lasted.

NEW AND NON-OFFICIAL REMEDIES

During June the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Abbott Laboratories:

Benzyl Benzoate (Abbott).

Elixir Benzyl Benzoate (Abbott).

Tablets Benzyl Benzoate (Abbott).

Arlington Chemical Company:

Pollen Extracts-Arlco:

Aster	Goldenglow	Popular
Birch	Goldenrod	Poppy
Cherry	Hickory	Red Top
Clover	June Grass	Rose
Corn	Locust	Rye
Dahlia	Maple	Sunflower
Daisy	Narcissus	Timothy
Dandelion	Oak	Walnut
Dock	Orchard Grass	Willow
Elm		

Ragweed (Ambrosia trifida).

Ragweed (Ambrosia artemisiaefolia).

Fritzsche Brothers, Inc.:

Benzyl Benzoate (Fritzsche).

Gilliland Laboratories:

Pertussis Bacillus Vaccine.

Diphtheria Toxin-Antitoxin Mixture.

Heyden Chemical Works:

Ichthynat.

Hynson, Westcott & Dunning:

Whole Ovary-H. W. D.

Whole Ovary Tablets-H. W. D. 5 grains.

Lederle Antitoxin Laboratories:

Antipneumoccus Serum (Polyvalent).

Gonococcus Glycerol Vaccine.

Pollen Antigen-Lederle (Fall Type).

Cellu Flour.—A specially pure cellulose in the form of flour. It is used as a means of filling out reduced diets, as in the Allen treatment for diabetics. It satisfies hunger without furnishing nourishment. Cellu Flour, after admixture with bran, baking powder, eggs, "India gum," or liquid petrolatum in varying proportions, may be used for the preparation of imitation bread, muffins etc. Dietetic Cellulose Company, Chicago.

Diaprotein Prepared Casein Flour.—Casein, to which has been added 4 per cent of a leavening mixture. It is employed in cases, such as diabetes, etc., in which carbohydrates are contraindicated. Diaprotein Prepared Casein Flour is adapted for the preparation of bread cakes, etc. Diaprotein Company, Chicago.

Anesthesin-Abbott.—A brand of benzocaine (see New and Nonofficial Remedies, 1920, p. 33) complying with the N. N. R. standards. The Abbott Laboratories, Chicago (Jour. A. M. A., June 5, 1920, p. 1577).

Pollen Extracts-Arlco.—Liquids obtained by extracting the proteins from the pollen of various species of plants. For a discussion of the actions, uses and dosage of pollen extracts see New and Nonofficial Remedies, 1920, p 226. Each of the Arlco products listed below is marketed in sets of four vials representing graduated concentrations: 1:10,000, 1:5,000, 1:1,000 and 1:500, respectively; also in concentrated solution in capillary tubes for diagnostic tests.

For hospital use the diagnostic solution is supplied in 1Cc., 2 Cc. and 3 Cc. containers: Aster Pollen Extract-Arlco, from pollen of **Aster multiflorus**; Birch Pollen Extract-Arlco, from pollen of **Betula populifolia**; Cherry Pollen Extract-Arlco, from pollen of **Prunus species**; Clover Pollen Extract-Arlco, from pollen of **Trifolium species**; Corn Pollen Extract-Arlco, from pollen of **Zea mais**; Dahlia Pollen Extract-Arlco, from pollen of **Dahlia variabilis**; Daisy Pollen Extract-Arlco, from pollen of **Chrysanthemum leucanthemum**; Dandelion Pollen Extract-Arlco, from polen of **Taraxacum officinale**; Dock Pollen Extract-Arlco, from pollen of **Rumex acetocella**; Elm Pollen Extract-Arlco, from pollen of **Ulmus americana**; Goldenglow Pollen Extract-Arlco, from pollen of **Rudbeckia laciniata**; Goldenrod Pollen Extract-Arlco, from pollen of **Solidago species**; Hickory Pollen Extract-Arlco, from pollen of **Carva alba**; June Grass Pollen Extract-Arlco, from pollen of **Poa pratensis**; Locust Pollen Extract-Arlco, from pollen of **Robinia pseudacacia**; Maple Pollen Extract-Arlco, from pollen of **Acer rubrum**; Narcissus Pollen Extract-Arlco, from pollen of **Narcissus species**; Oak Pollen Extract-Arlco, from pollen of **Quercus species**; Orchard Grass Pollen Extract-Arlco, from pollen of **Dactylis glomerata**; Poplar Pollen Extract-Arlco from pollen of **Populus balsamifera**; Poppy Pollen Extract-Arlco, from pollen of **Papaver somniferum**; Ragweed Pollen Extract-Arlco, from pollen of **Ambrosia trifida**; Ragweed Pollen Extract-Arlco, from pollen of **Ambrosia artemisiaefolia**; Red Top Pollen Extract-Arlco, from pollen of **Agostis alba**; Rose Pollen Extract-Arlco, from pollen of **Rosa rugesa**; Rye Pollen Extract-Arlco, from pollen of **Secale cereale**; Sunflower Pollen Extract-Arlco from pollen of **Helianthus annuus**; Timothy Pollen Extract-Arlco, from pollen of **Phleum pratense**; Walnut Pollen Extract-Arlco from pollen of **Jugland nigra**; Willow Pollen Extract-Arlco, from pollen of **Salix fragilis.**—Arlington Chemical Company, Yonkers, N. Y.

Antipneumococcus Serum (Polyvalent) Types I, II and III.—An antipneumococcus serum (see New and Nonofficial Remedies, 1920, p. 269) prepared by immunizing horses with dead and living pneumococci of the three fixed types and standardized against Type I culture. Marketed in double ended vials containing 50 Cc. each, with needle and tubing; also in bottles of 100 Cc. Lederle Antitoxin Laboratories, New York.

Pertussis Bacillus Vaccine.—A pertussis bacillus vaccine (see New and Nonofficial Remedies, 1920, p. 285) prepared from several strains of pertussis bacillus (Borget-Gongou). Marketed in packages of four syringes containing 250, 500, 1,000 and 2,000 million killed bacteria, respectively: in packages of four ampules containing 250, 500 1,000 and 2,000 million killed bacteria, respectively: also in 5, 10 and 20 Cc. vials containing 2,000 million killed bacteria per cubic centimeter. Gilliland Laboratories, Inc., Ambler, Pa. (Jour. A. M. A., June 26, 1920, p. 1779).

PROPAGANDA FOR REFORM

Chaulmoogra Preparations and Sodium Morrhuate.—Chaulmoogra oil and preparations made from it are at present extensively employed and seem to produce amelioration in the majority of lepers to whom it has been administered persistently. Investigation has shown that chaulmoogra oil contains bactericidal substances that are one hundred times more active than phenol, and that this bactericidal action is specific for the acid fast group of bacteria to which the causitive organism of leprosy belongs. The product is inactive against all other organisms studies. On the other hand it has been shown that sodium morrhuate and the fatty acids of cod liver oil do not have a similar action in tuberculosis which is also due to an acid fast bacterium. The value of chaulmoogra preparations in tuberculosis remains to be demonstrated, and their clinical trial should await their experimental investigation. The indiscriminate use of drugs in tuberculosis may arouse false hopes and may not be without danger to the patient (Jour. A. M. A., June 5, 1920, p. 1578).

Syrup Leptinol.—The Council on Pharmacy and Chemistry reports that Syrup Leptinol (formerly called Syrup Balsamea) is inadmissible to New and Nonofficial Remedies, first, because the manufacturer failed to give the profession information either in regard to the amount of the potent ingredient or the method of determining its identity and uniformity; secondly, because of the unwarranted recommendation for its use in such infectious diseases as pneumonia and epidemic influenza and the lack of satisfactory supporting evidence of the alleged therapeutic efficacy in other diseases; and thirdly, because the recommendation for its use appearing on and in the trade package constitutes an indirect advertisement to the public. Syrup Leptinol is marketed by the Balsamea Company of San Francisco. It is a balsamic syrup made from an unclassified species of Leptotaenia (a plant belonging to the parsnip family) which grows in Nevada. No evidence was presented to show that it had the remarkable properties ascribed to it by the Balsamea Company. The clinical reports which were reported were little more than chance observations and lacked all control (Jour. A. M. A., June 5, 1920, p. 1590).

What Is the Therapeutic Value of the Hypophosphites?—A research conducted by the Council on Pharmacy and Chemistry shows: There is no reliable evidence that they exert a physiologic effect. It has not been demonstrated that they influence any pathologic process. They are not foods. If they are of any use, that use has not been discovered. The hypophosphites were introduced into medicine by Churchill, who advanced the theory, long since discarded, that the so-called tuberculosis diathesis

was due to a phosphorus deficiency. It is now known that little phosphorus, if any, is assimilated from hypopohosphites — far less than from phosphorus compounds of ordinary foods. As a result of the power of advertising, many physicians still prescribe hypophosphite combinations (Jour. A. M. A., June 12, 1920, p. 1661).

More Misbranded Nostrums. — The following "patent" medicines have been the subject of prosecution by the federal authorities, chiefly because the therapeutic claims made for them were false: Sealeaf Emulsion, an emulsion of cod liver oil and malt extract; Green Mountain Herb Tea, and Sabine's Indian Vegetable Tea, consisting essentially of senna, fennel, elder flowers, anise, triticum, sassafras, American saffron, coriander, licorice root, butternut bark, buckthorn and Epsom salt; Sabine's Indian Vegetable Cough Balsam, consisting essentially of alcohol, chloroform, tar, resin, sugar and traces of alkaloids; Bovinina, apparently a meat extract; alkaloids; Bovinina, apparently a meat extract; Fruit-a-Tives, containing essentially of extracts of aloes, consisting essentially of alcohol, colchicin, ammonium salts, vegetable extractives and water; McDowell Ginseng Bitters, a solution of plant extract, containing small quantities of glycerin and a zinc salt (Jour. A. M. A., June 12, 1920, p. 1661).

Quality of Acetylsalicylic Acid.—The following brands of acetylsalicylic acid have been found of satisfactory quality and are in New and Nonofficial Remedies: Acetylsalicylic Acid-Heyden, Acetylsalicylic Acid-M. C. W., Acetylsalicylic Acid-Merck, Acetylsalicylic Acid (Aspirin)-Monsanto, Acetylsalicylic Acid-P. W. R., Acetylsalicylic Acid-Squibb, and Aspirin-L. and F. An examination made in the A. M. A. Chemical Laboratory two years ago showed that the product supplied as acetylsalicylic acid was of equal quality with the German made Aspirin Bayer. The Aspirin Bayer now made in America and exploited with misleading claims is controlled by the Sterling Products Company, which sells cascarets, danderine, etc. (Jour. A. M. A., June 12, 1920, p. 1664).

Formitol Tablets.—In a report of the Council on Pharmacy and Chemistry, it was stated that Formitol Tablets of the E. L. Patch Company contained formaldehyd (or paraformaldehyd) and some hexamethylenamin, and that the formaldehyd (or paraformaldehyd) had been produced by the decomposition of the hexamethylenamin originally present in the tablets. The Council now reports that the Patch Company declares that no hexamethylenamin is used in the manufacture and that, therefore, that which was found must have been produced from the formaldehyd and ammonium chlorid in the tablets. The Council further reports that a printed sheet received from the Patch Company conveyed the information that Formitol Tablets contained ammonium chlorid, benzoic acid, citric acid, guaiac, hyoscyamus, menthol, paraformaldehyd and tannic acid, but gave no information as to the amounts of any of the ingredients except that each tablet was declared to represent 10 minims of a 1 per cent formaldehyd solution. Because of the non-quantitative, and, therefore, meaningless "formula", the A. M. A. Chemical Laboratory made an analysis of the tablets. The analysis indicated that the combined weight of all the claimed active ingredients is less than one grain per tablet.

OF GENERAL INTEREST

Dr. Fred Selle of Tyler will move to Winthrop.

Dr. T. C. Quigley, formerly of Hibbing, has located at Owatonna.

Dr. and Mrs. Carl D. Kolset of Benson have taken a trip to Norway.

Dr. A. Gullixson formerly of Briceyln has opened offices in Albert Lea.

Dr. Paul F. Brown of Minneapolis was recently awarded the Distinguished Service Cross.

Dr. W. R. Humphrey of Stillwater was named country physician to succeed Dr. E. E. Wells.

Dr. Woodward Colby of Minneapolis has become associated with Dr. T. L. Birnberg, Lowry Bldg., St. Paul.

Dr. W. S. Leech of Roseau has sold his practice to Dr. McCoy of Ohio. Dr. Leech will move to Tampa, Fla.

Dr. F. H. Dubbe of Minneapolis has located in New Ulm and has associated himself with Dr. O. C. Strickler.

Dr. F. A. Swartwood has recently been appointed surgeon for the M. & St. L. and C. & N. W. railroads at Waseca.

Drs. E. M. McLaughlin, B. P. Rosenberry and W. W. Nauth have formed a partnership and will practice in Winona.

Dr. George W. Davis of Duluth has retired as an active practitioner after practicing in Duluth for thirty-eight years.

Dr. George Dunn of Elk River has located in Minneapolis. Dr. Dunn is a recent graduate of Johns Hopkins University.

Dr. H. E. Marsh will leave the Mayo Clinic of Rochester to become associated with the Jackson Clinic, Madison, Wis.

Dr. M. Sundt of Hanska has disposed of his practice to Dr. Egbert Borgeson of St. Paul. Dr. Sundt will move to Minneapolis.

At a meeting of the Southwestern Minnesota Medical Society held in Windom, Pipestone was selected for the next meeting place.

Dr. Floyd Woodward of Minneapolis has moved to Jamestown, N. D., where he will have charge of the medical side of the clinic there.

Dr. Edward D. Anderson announces the opening of his offices at 730 La Salle Bldg., Minneapolis, and will specialize in diseases of children.

A location for a physician is offered at Bronson.

Minn. Mr. C. H Swanson, secretary of the Commercial Club, will furnish any particulars.

A physician is wanted at St. Hilaire, Minn. Particulars may be obtained from Mr. A. P. Wall, cashier, Farmer's State Bank of St. Hilaire.

Dr. Edwin R. Eisler, for the last year interne at the City and County Hospital, St. Paul, has opened offices at 314 Syndicate Bldg., Minneapolis, July 15th.

Dr. J. R. Manley, Duluth, has resigned as medical inspector and will take up post graduate studies in New York. Dr. C. W. Taylor has been appointed to fill the vacancy.

Dr. Carl Cowin of Minneapolis, who has been associated with Dr. Murray has joined the clinic at Jamestown, N. D., where he will specialize in nose and throat work.

Dr. Willard White, who has just completed an internship at the Cook County Hospital at Chicago is associated with Dr. R. E. Farr at 301 Physicians and Surgeons Building, Minneapolis.

The office of the District Supervisor of District No. 10 of the U. S. Public Health Service was moved July 2, 1920 from the Lowry Bldg., St. Paul, to the Keith-Plaza Bldg., Minneapolis.

Dr. Stanley R. Maxeiner of Minneapolis, fomerly with Dr. R. E. Farr, will open offices at 1035 Metropolitan Bank Building for the practice of surgey, paying special attention to local anesthesia.

Dr. Louis P. Gross, for the last year interne at the City and County Hospital, St. Paul, after a summer's vacation will start a nine months service at Augustana Hospital, Chicago, under Dr. A. J. Ochsner.

Dr. Arnold P. Gruenhagen, for the last year and a half interne at the City and County Hospital St. Paul, has opened offices at 824 Lowry Bldg., St. Paul. He will be associated with Drs. Comstock and Rutherford.

Dr. Swan Ericson, for the last year interne at the City and County Hospital, St. Paul, will locate at Elmore, Minn., where he will be associated with Dr. H. Blong.

Dr. Frank G. Hendenstrom, for the last year interne at the City and County Hospital, St. Paul, will locate at Braham, Minn. He will be associated with Dr. C. Swenson.

Dr. O. L. Asher member of the medical staff at the State Hospital at St. Peter has resigned and moved to Jacksonville, Ill., where he has accepted a similar position on the staff of the State Hospital at that place.

Dr. Charles E. Hunt of the firm of Drs. Witherstone, Wilson, Hunt, Anderson and Miller of Grand Forks, N. D., has left for a month's post-graduate work in Chicago under Drs. DeLee and Abt in obstetrics and pediatrics.

The Public Health Organizations are employing so many graduate trained nurses that the number available for private cases is becoming more and more limited. Special efforts are being made by various hospitals to increase the size of their undergraduate classes, many of which begin September 1, 1920. The co-operation of the medical profession in properly directing young women interested in nursing as a pro-profession, is desired.

A June bulletin issued by the Venereal Division of the State Board of Health announces that this Bureau is now in a position to render the services of a physician expertly trained in the diagnosis and treatment of venereal diseases to any region of the state so desiring. This service is for physicians who desire assistance in the preparation and administration of arsphenamine, the taking of blood specimens, examination of smears, etc. We are reminded that the service of the laboratory is free to all patients and all physicians.

Attention is called by the Venereal Division of the Public Health Service at Washington, to the exploitation of various arsenic preparations not related to the arsphenamine group for the treatment of syphilis. This office believes that only preparations of the arsphenamine group should be used for subcutaneous, intramuscular or intravenous medications. The following firms are now licensed to manufacture arsphenamine and neo-arsphenamine: Dermatological Research Laboratories, Philadelphia, Pa.; H. A. Metz Laboratories, New York; Diarsenol Co., Buffalo, N. Y.; Takamine Laboratories, Clifton, N. Y.; Lowy Laboratory, Newark, N. J. If it is desired to use arsenic in other form in experimental work, previous authority from the Bureau should be secured.

The Graduate School of the University of Minnesota will offer a nine months preliminary course of graduate work in ophthalmology and oto-laryngology. The course will consist chiefly of advanced work in the science departments, giving fundamental training essential to this speciality, and will include special anatomy, embryology, and histology of the sense organs and of the head region; physiologic optics; physiology of the special senses and of speech; pathology of the eye, ear, nose and throat; and bacteriology as applied to these organs. A systematic course of instruction, consisting of lectures, demonstrations and quizzes on assigned topics, will be given and will cover the field of ophthalmology and oto-laryngology. Clinical work in the out-patient department, consisting of the taking of case histories, examination and treatment of clinical cases, will be required. The course is not intended to prepare students to enter private practice, but is designed to serve as a basis for further thorough clincical training, such training to be obtained by service as resident in a special hospital, or by acting as assistant in a clinic of recognized standing, or by service in a fellowship under the University of Minnesota Graduate School plan. The course will begin Sept. 29, 1920, and will be limited to ten students, who must be graduates of Class A Medical Schools, and have completed one year internship in an approved general hospital. In-

formation will be sent on request addressed to the Dean of the Graduate School, University of Minnesota.

A fellowship in the Graduate School of the University of Minnesota for research in some problem concerned with the cure of prevention of tuberculosis has been established and will be supported by the Hennepin County Tuberculosis Association of Minneapolis, according to an announcement by Dean E. P. Lyon, of the University Medical School.

The fellowship will yield $750 the first year and progressively increasing amounts to be appropriated by the tuberculosis association for the second and third years. The candidate for the fellowship must be a graduate of a Class A medical school, according to the terms announced. No teaching or other service will be required of the student. The holder of the fellowship will be expected to devote his time to a study of some phase of the causes, prevention, or cure of tuberculosis.

Every facility of the University will be placed at the disposal of the student, including the splendidly equipped laboratories, the University hospital, clinics and dispensary, and the Mayo clinics at Rochester. In addition, the Twin Cities combined population of 600,000, their thirty hospitals, and the easily accessible tuberculosis sanatoria, four in number, constitute an inviting field for the medical research student who wishes to study the tuberculosis problem from either its clinical or social aspect.

Candidates for the fellowship are directed to write for application blanks to the Dean of the Graduate School, University of Minnesota, Minneapolis, Minn.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH.

THOMAS A. PEPPARD
LA SALLE BLDG., MINNEAPOLIS

STUDIES ON EXPERIMENTAL PNEUMONIA—II PATHOLOGY AND PATHOGENESIS OF PNEUMOCOCCUS LOBAR PNEUMONIA IN MONKEYS: Francis G. Blake and R. L. Cecil (Jour. Exper. Med., April 4, 1920). Autopsies on forty cases of experimentally produced pneumonia in monkeys furnish the material for this second paper. Twenty-seven died either from the disease or from complications. Thirteen were killed at varying intervals.

Experimental pneumonia in monkeys is identical pathologically with lobar pneumonia in man. The pneumococcus invades primarily some points proximal to the hilum and spreads by way of the perivascular, peribronchial and septal interstitial tissue and lymphatics; quickly reaches the pleura and invades the alveolar structure by way of the alveolar walls. The initial mode of invasion may be by direct penetration into the walls of the larger bronchi near the hilum. Hepatization begins centrally and spreads toward the periphery and is a constantly progressive process. With the development of hepatization the conspicuous interstitial lesions of the earliest stages, gradually diminish and are often largely marked when complete lobar consolidation has developed. Resolution is frequently accompanied by a varying degree of organization of the grosser framework of the lung. The right and left lobes were about equally affected, but the lower lobes were involved twice as frequently as the upper or middle lobes, in this series.

T. A. Peppard.

PSEUDOCHYLOUS ASCITES IN A CASE OF SYPHILITIC NEPHROSIS: E. L. Tuohy (An. Med., April, 1920). The author reports a case of typical chronic syphilitic nephrosis with pseudochylous, which is rather infrequently described in the literature. Milky transudates are classified as: (1) The chylous; (2) The chyliform; (3) The pseudochylous. These differ in certain salient features, the chylous form arising from pathological conditions in the lymphatic tract, and showing a high sugar and fat content. The chyliform is described as similar in appearance, containing fat globules in abundance, very likely from disintegration of cellular material. On the other hand, the pseudochylous ascites has the physical properties of the others, but yet is free from the presence of sugar and fat. The milky color in these latter cases is thought to be due to the presence of a pseudo-globulin and lecithin held in solution by the inorganic salts.

The case the author describes is typical of these cases of pseudochylous ascites, which apparently is usually found in the chronic nephroses, particularly of the syphilitic variety, as two-thirds of the cases previously reported bear out. The patient in question had a positive Wassermann, and gave a history of exposure to inclement weather, which caused the exacerbation of symptoms. He complained subjectively of shortness of breath, with swelling of the extremities. Objectively the patient showed the characteristic urinary signs of a chronic nephrosis, in the way of numerous casts, a high albumin content, oliguria, and with an entirely normal blood picture aside from the four plus Wassermann. Blood pressure was normal at all times, with the heart tones good, and the physical examination revealed chiefly the protuberant abdomen containing a large amount of fluid, as well as the edematous tissues generally.

Patient did not respond very materially to treatment, and about 24 hours before his death showed

evidences of an acute peritonitis. Being in extremis operation was inadvisable, and the patient died the following day. The autopsy findings also were quite typical. The abdomen and the pleural cavities contained this pseudochylous fluid in abundance, the description of which is given in detail and is found to be in accord with previous descriptions. The kidneys showed typical tubular changes, very slight interstitial overgrowth, and the glomeruli seemed to be entirely normal in appearance histologically.

In the conclusion, he summarizes briefly the characteristic features of a chronic nephrosis; namely, the extraordinary number of true casts and high albumin content of the urine, the high blood count, the absence of increased blood pressure, with resultantly the absence of cardiac hypertrophy, normal P. S. P. output, no increased N. retention in the blood; a clinical picture of a wet nephritis, pseudochylous transudates, the positive blood test, and the apparent inflammatory reaction (intra-abdominal) just before death, which is in full accord with Volhard and Fahr's statistics in which they claim that most of these patients die of a pneumococcic peritonitis, for which, however, they do not give any cause.

F. J. Hirschboeck.

X-RAY STUDIES OF THE SEMINAL VESICLES AND VASA DEFERENTIA AFTER THE URETHROSCOPIC INJECTION OF THE EJACULATORY DUCTS WITH THORIUM: Hugh H. Young and Charles A. Waters. (Johns Hopkins Hosp. Bull., Jan., 1920.) Attention is called to the role of the seminal vesicles in the production of any one of the numerous types of arthritis, cardiac and gastro-intestinal disturbances, and neuroses, and the need of a method by which the condition of the canal system above the verumontanum can be graphically depicted without resorting to opening the vas deferentia in the groin as has been done by Malfield, Mills, Thomas and Pancoast and others.

A method is described by which the vesicles can be injected with thorium through the catheterized ejaculatory ducts following endoscopy. By means of a special forked cannula it was found possible to inject both seminal vesicles and both vasa deferentia. By the use of Young's urological table it is possible to take stereoscopic radiographs of the patient while in the position for cystoscopy without disturbing him.

R. G. Allison.

A STUDY OF THE EFFECT OF PULMONARY TUBERCULOSIS ON VITAL CAPACITY: F. W. Wittich, J. A. Meyers, F. L. Jennings (Sixteenth An. Meet. Nat. Tub.. Ass'n.) Prof. Georges Dreyer of Oxford University lecturing in this country under the direction of the Mayo Foundation stimulated the authors' attention to the importance of the vital capacity measurement as a guide to physical fitness under different conditions and in different classes of individuals. John Hutchinson as early as 1846 made use of the study of the vital capacity of the lungs as an aid in the diagnosis of pulmonary diseases, demonstrating that cases of pulmonary tuberculosis showed a definite lowered vital capacity. During the recent war the vital capacity measurement was a decisive factor in the selection and rejection of candidates for the British Flying Service.

Dreyer's observations based on his study of 16 men and boys carefully selected on account of their physical fitness and covering as wide a range in weight, height, etc. as possible as well as those of Schuster's extensive measurements of vital capacity on 959 Oxford undergraduates, enabled him "to establish definite relationships between vital capacity and body surface, body weight, stem length and chest measurement" expressed in definite simple formulae. Thus by means of a few fairly accurate standards arrived at so far he studied the effect of pulmonary tuberculosis on the vital capacity of about 150 patients at Brompton Hospital. His results are very promising and to quote Dreyer's own words he has been able, without seeing the patients or knowing anything about the diagnosis, but simply from measurements (recorded and sent to me by Dr. Burrell) of the vital capacity and the various body measurements mentioned above and by subsequent calculation, to classify these persons as normal individuals, or as examples of mild, of moderate, or of severe pulmonary tuberculosis, in practically absolute agreement, as afterward appeared, with the clinical diagnosis and classification made at the time at the Brompton hospital.

The authors' observations consist of the vital capacity together with the other body measurements taken at the same time of about 200 patients, 150 being cases of diseases of the respiratory tract, 100 of whom are definitely classified tuberculous ones. Detailed methods of procedure are given as well as a discussion of the effect of such a test upon tuberculous patients. Tables are presented showing the results as influenced by different stages of the disease. It appears that the careful study of vital capacity in its proper relationship to other body measurements will give important information as to the stage of the disease, the beneficial effects of sanatorium treatment, the progress of the disease, and, when the patient has arrived at the happy termination of his sanatorium treatment, an accurate method of determining his actual physical fitness or limitations.

PHYSICAL EXAMINATION VS. THE X-RAY IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS: George W. Norris (Sixteenth An. Meet. Nat. Tub. Ass'n.) The human senses—sight, touch and hearing—still excel the X-ray in the diagnosis of tuberculosis of the lungs. The X-ray diagnosis of pulmonary diseases has made great strides within the last few years. It has not, however, and probably

will not, displace physical diagnosis. The latter is far superior when it comes to be a question of activity or non-activity of a lesion. Even when X-ray technic is perfect, it requires great expertness to interpret the plates properly. Tuberculosis is not by any means always differentiable from other conditions such as pneumoconiosis by radiographic means. Both methods of examination should be employed.

SILENCE IN THE TREATMENT OF PULMONARY TUBERCULOSIS: S. W. Schaefer, (Sixteenth An. Meet. Nat. Tub. Ass'n.) There is a growing realization of the importance of absolute rest in treating patients with active pulmonary lesions. Experimental and clinical data support the employment of rest. In certain cases, however, bed rest does not give sufficient immobilization of the lungs. Patients with the laryngeal lesions when not allowed to talk, frequently show improvement in their lung condition, when before this the pulmonary process had been extending. Some patients even though in bed, exercise their lungs by talking as much as they would if they were up and around. More attention should be paid to the amount of talking in which patients are allowed to indulge. It is not necessary to await the development of a laryngeal involvment before giving them the benefit of silence.

Classes of cases exist in which silence is particularly indicated. Method of using, and case reports were given. The only objection to the use of silence is in its effect on the mental condition. On the other hand the advantage of silence is not solely due to the localized effect on the lungs, but also to the lessening of general bodily fatigue and the absence of mental excitement. The treatment requires the most careful supervision and the encouragement of the patient by the physician. But if the physician has the absolute confidence of the patient, with the judicious use of psychotherapy and the improvement in the patient's condition apparent to him, the mental attitude will improve along with the physical.

THE DIAGNOSTIC VALUE OF ELECTRO-CARDIOGRAPHY OF HEARTS BEATING REGULARLY: Paul Dudley White (Med. Clin. No. Am., January, 1920). The electro-cardiogram is useful in the clinical study of cardiac patients who have a regular pulse as well as in cases of arythmia. Dr. White takes up in detail these various conditions which with a regular pulse of moderate rate show characteristic electro-cardiograms, considering the auricular, ventricular, and general conditions in order as follows: 1—Auricular hypertrophy in mitral stenosis. 2—Auricular flutter. A case with a regular pulse of 61, and the auricles beating regularly at 244. A 4 to 1 heart block. 3—Ectopic auricular rhythm; case: pulse rate 54. 4—Auriculo, ventricular rhythm; Auricular standstill; and ventricular escape. 5—Auriculo-ventricular heart block: (a) Delayed auriculo-ventricular conduction. (b) 2 to 1 heart block. (c) Complete block. 6—Intra-ventricular heart block, including right and left and arborization block. 7—Ventricular preponderance. 8—Dextrocardia. 9—Myocardial weakness. 10—Digitalis effect. 11—Hypothyroidism. 12—Tremor.

FRANK W. SPICER.

SURGERY

SUPERVISORS:
E. MENDELSSOHN JONES
LOWRY BLDG., ST. PAUL.
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER.

FOREIGN BODIES OF DENTAL ORIGIN IN A BRONCHUS, PULMONARY COMPLICATIONS: C. A. Hedblom, (Ann. Surg, May, 1920). It is possible that a large proportion of cases of foreign bodies of dental origin in the bronchi have not been recorded, since of Weist's 1,000 cases 103 only were from the literature; the other 897 were collected by personal communication.

In the past four years at the Mayo Clinic there have been seven cases of pulmonary suppuration following dental operations or trauma. In two cases the tooth was expelled spontaneously; in one it was discharged through a thoractomy wound, and in one it was found at postmortem. In the other cases no foreign body was found. The author reports these seven cases in detail and reviews forty-five proved cases from the literature. In the fifty-two cases the foreign bodies were as follows:

	Cases
Teeth	37
Artificial teeth	4
Dentures	2
Root canal broach	2
Dental burr	3
Allen's dental cement	1
Plaster of Paris	1
Hard rubber from gag	1
Blade of forceps	1

The bodies were most often in the right lower lobe. In twenty-six cases the accident occurred during teeth extraction under general anesthesia. The symptoms are those which are manifest immediately and those from prolonged presence of the foreign body in the bronchus. Coughing is the most common symptom, with the frequently associated symptoms of dyspnea, cyanosis, wheezy respiration, pain in the chest, and nausea. In seven cases there were no symptoms. In thirty-six cases of the series there was evidence of pulmonary suppuration. In the sixteen uncomplicated cases the symptoms were marked in seven and not mentioned in nine. The diagnosis was made by x-ray in five. In four cases the foreign body was expelled spontaneously; in ten broncho-

scopic removal was effected; two patients died following bronchoscopy and thoractomy.

In the thirty-six complicated cases late symptoms developed: Coughing usually with purulent sputum, was present in twenty-nine; hemoptysis in eight, and pain in the chest in eleven. Of sixteen x-ray reports the foreign body was shown in but four, abscess in five, and limitation of movement of the diaphragm by fluoroscopy in one. Five patients were treated by bronchoscopy, three successfully. Fifteen were treated by thoractotomy, and thirteen had the drainage operation for the suppurating process.

Three of the thirteen patients who expelled the foreign body spontaneously, died. Nine of the fifteen patients on whom a thoracotomy was performed made a complete recovery; two were greatly improved, and four died. The postmortem findings in the nine fatal cases were empyema, bronchiectasis, abscess, ulcerated bronchus, and gangrene.

In making a diagnosis of foreign body in the bronchus the history of the case is of first importance. A positive diagnosis may be made by means of history, X-ray or bronchoscopy. In early uncomplicated cases bronchoscopy is the best method of diagnosis and removal. If the foreign body is not expelled spontaneously, bronchoscopy is the only method of treatment to be considered in early uncomplicated cases, thoracotomy being reserved for cases in which there is suppuration.

V. C. Hunt.

TUBERCULOSIS OF THE BREAST: Eugene P. Hamilton, (Surg., Gyn. and Ob., June, 1920). Mrs. S. B., aged 44, whose husband had died of tuberculous laryngitis eight years before, gave a history of the discovery of tuberculosis bacilli in the sputum five years before. These symptoms disappeared after six months of treatment. Three weeks before examination a tumor was noticed in the breast. There was no tenderness nor redness of the skin. A radical amputation of the breast was performed March 30, 1918, and a caseous area was found in its center. A microscopic section showed typical tubercles and giant cells. No tuberculosis bacilli were found in the sputum. In 1829 Sir Astley Cooper reported microscopic features of "scrofulous swelling in the breast", but since then few cases have been reported; to date the literature contains only 180. The condition is classified as (a) primary and (b) secondary, the latter when associated with tuberculosis in some other organ of the body.

The avenue of entrance of the bacilli may be through abrasions of the skin of the nipple, yet it has been shown that tuberculosis may gain entrance through intact skin. In secondary infections of the breast the most frequent foci are found in (1) the lungs and pleura, (2) the cervical and auxiliary lymph nodes, and (3) the bones. Slight trauma has been noted to be the exciting cause in a large percentage of these cases. The differential diagnosis should be made from simple pyogenic infection, carcinoma or sarcoma, gumma, and actinomycosis.

Briefly the characteristic symptoms are (1) the rapidity of the disease process, (2) early fistulous formation, (3) the involvement of the lymph nodes, (4) pain when inflammation exists, and (5) the general condition of the patient. The treatment is simple amputation of the breast with removal of the affected glands. In primary cases the prognosis should be favorable in 100 per cent., but in secondary tuberculosis the prognosis depends on the primary focus.

F. R. Sanderson.

SPERMATOCELES AND HYDROCELES CONTAINING SPERMATOZOA: Randolph Winslow, (Surg., Gyn. and Ob., June, 1920). A spermatocele is a cystic tumor which usually arises from about the juncture of the testicle and epididymis and is generally small, painless, and inverted pear shape. It simulates hydrocele when the cystic mass protrudes into the tunica vaginalis. It occurs usually in men between the age of 20 and 40 and is sometimes seen in older men; more frequently on the right side, but it may be bilateral. The condition is thought to be due to degenerative changes in fetal remains about the testicle, but A. C. Cabot believes the spermatocele is a true rentention cyst due to any process which blocks the outlet of the seminiferous tubules. Of the two varieties, the extravaginal and the intravaginal, the former is the most common. It develops when the cyst develops in a direction in which there is no covering of the tunica vaginalis. The diagnosis is made by aspiration or incision, but should be suspected from the location of the cyst between the testicle and the epididymis. When associated with hydrocele the differentiation is difficult and is unimportant.

The occurrence of six cases of hydrocele containing spermatozoa and of one true spermatocele associated with hydrocele under observation has brought up the question how do spermatozoa get into hydroceles? Is the hydrocele due to the presence of spermatozoa, or does the hydrocele, by pressure, cause a communication between the seminiferous tubules and the cavity of the tunica vaginalis? Trauma may produce the latter, but in only one case was there a history of injury. It is probable that in some cases true spermatoceles rupture into hydroceles, thereby permitting the ingress of spermatozoa into the hydrocele. In several cases in which there were two or more sacs it is probable that one of the cysts had ruptured into the hydrocele. The external appearance of the cyst does not differ from the ordinary hydrocele, and the presence of spermatozoa is suspected when a whitish fluid is withdrawn. Possibly by transillumination, light would not show as clearly as when the sac contained straw colored fluid.

The treatment of spermatocele is usually excision, while the treatment of the hydrocele containing sper-

matozoa is similar to that of ordinary hydroceles; namely, excision of the tunica vaginalis, suturing the tunica behind the testicle, or, Andrews' bottle operation.

F. R. Sanderson.

GYNECOLOGY AND OBSTETRICS

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MALIGNANT MYOMATA AND RELATED TUMORS OF THE UTERUS: Newton Evans. (Surg. Gyn. and Ob. Vol. 30. No. 3.) A study of 72 specimens occurring in 4,000 cases of myomata from the Mayo clinic. About 1 in 40 of malignant growths of the uterus is of non-epithelial origin. All spindle cell tumors develop from smooth muscle cells in fibromyomata which to gross appearance are benign, or develop as growths which for a long time cannot be differentiated from benign tumors. There is much variation (as low as 0.4% to as high as 10%) in the frequency of such changes in myomata. There is no definite criterion upon which the diagnosis of malignancy is made. The following characteristics are considered by different authorities: Change in shape and arrangement of the component cells, lack of cell differentiation, variations in the staining properties of the nuclei, presence of "Giant cells," presence of mitotic figures, amount of stroma and character of bloodvessels present. The author classifies his cases on the basis of the number of mitotic figures estimated in a cubic milimeter of tissue. Group (1) 13 cases showing from 1,300 to 22,000 per cubic mm., 11 of whom had died of recurrence in from one to 18 months. Group (2) 11 cases showing from 800 to 2,000 figures per cubic mm., 9 of whom were known to be living and well from 5 months to 13 years later. Group (3) with few or no figures, there was no record of recurrence. He believes that large and atypical mitotic figures are always a sign of marked malignancy. "Giant cells" with atypical nuclei were present in comparatively small numbers in group 1, there were few or none in group 2, but they were frequent in the third group of low or doubtful malignancy. In these there was also a large amount of fibrous stroma with tendency to hyaline formation, and the author assumes that giant cells are not significant of malignancy but rather indicate a tendency to degeneration. Direct cell division with large cells approaching giant cell type is frequent in the less malignant tumors and the author quotes evidence to prove that such cells have lost their power of invasion and malignancy. There is nothing to prove that absence of cell differentiation is an essential evidence of malignancy, and the only dependable microscopic proof lies in the frequency of mitotic figures found. Accepting this as the standard, the author estimates the frequency of actual malignant degentration as 0.67%. He believe that actively growing tumors which contain an appreciable number of mitotic figures are in a stage of transition toward malignancy and that many of the others are definitely premalignant.

Archibald L. McDonald.

THE ROLE OF CARBOHYDRATES IN THE TREATMENT OF TOXEMIAS OF EARLY PREGNANCY: Titus, Hoffman and Givens. (Jour. A. M. A. Vol. 74, No. 12.) In this excellent practical presentation of one theory concerning the etiology and treatment of these toxemias, the authors comment on the difficulty of differentiating between the mild and severe cases, and suggest that much profitable work may be done in the study of the milder ones. It is generally assumed that the vomiting is due to toxic substances elaborated in the maternal metabolism: (1) Autointoxication from the gastro-intestinal tract; (2) disturbance in the internal secretions; (3) from the product of conception; (4) abnormal liver function. The authors have developed a systematic dietary based on frequent feeding with an excess of carbohydrates and restriction of meats and proteids. In severe cases they recommend: rest in bed, withhold all food by mouth till vomiting is controlled, gastric lavage, on account of the tendency to reversed peristalsis, magnesium sulphate by stomach tube, enteroclysis with glucose and soda solution, and sedatives (bromides). Afterwards use small amounts of fluids at frequent intervals; whey, peptonized or skim milk, etc., alternated with 2 ounces of 10% glucose with 2% sodium bicarbonate every two hours. Then increase amount and variety but with care. In desperate cases advise glucose and soda (15 to 20 grams of glucose in 250 Cc. of water, sterilized in the autoclave) intravenously. Water is urgently demanded and must be given by rectum or by mouth. They believe that carbohydrate deficiency and starvation is the essential factor, which they substantiate by extensive quotations from the literature and their own observations. They explain an unusual demand on the part of the fetal metabolism for carbohydrates from the mother, and therefore the necessity for increasing that part of the dietary. Failing an adequate supply of glycogen from the diet, the reserve supply in the liver is depleted to a dangerous degree, resulting in fatty degeneration and lowered resistance to certain toxines. They describe the following sequence: hunger due to increased demands, intolerance of the stomach, and a vicious circle with decreased tolerance and starvation, particularly with regards carbohydrates, and toxemia. On the basis of experimental work, the authors have established a normal time curve of the ability of the liver to store as glycogen a known

amount of glucose given intravenously, and estimate the prognosis in a given case depending on the amount of glucose which can be stored in a certain time.

ARCHIBALD L. MCDONALD.

THE TREATMENT OF ECLAMPSIA BY TRANSFUSION OF BLOOD: W. Blair Bell, (British Medical Journal, May 8, 1920). In 1911 Dold discovered that many viscera contained a toxine, lethal to animals, but wholly neutralized by normal serum. Obata found that the same was true of placental extract in all respects. In eclampsia, however, the blood serum had for some reason or other lost its neutralizing power.

Keeping these experimental discoveries in mind, Bell, confronted by a case of eclampsia which had been reported to him as dying and who had not improved under other treatment, tried the expedient of transfusing 500 cc of citrated venous blood from her husband. The patient's convalescence was uninterrupted and so satisfactory that he would perform blood transfusion immediately in any other case coming under his observation.

ALBERT G. SCHULZE, M. D.

PEDIATRICS

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CEREBRAL COMPLICATIONS IN MUMPS: Horton R. Casparis (Am. Jour. Dis. of Child., Sept. 1919). Involvment of the central nervous system during the course of mumps has been recognized for many years. The occurrence of frank symptoms as a complication of mumps is extremely rare. It seems to vary with different epidemics however. The onset comes more often at the height of mumps. The first symptoms usually are a rise of temperature, headache, and vomiting, but these are not constant. However, one does find headaches, vomiting, drowsiness, rigid neck, or a positive Kernig's sign.

The cerebrospinal fluid findings have been rather constant. The fluid has always been sterile. It is clear and under increased pressure, the test for globulin is usually positive, but not markedly so. It may be negative at first with a high cell count and later on become positive as the cell count decreases. There is no film formation. The cells present are usually lymphocytes and vary from slightly above normal up to one or two thousand. More frequently there are several hundred. The number of cells bears no proportion to the intensity of the symptoms. There is some difference of opinion as to whether or not the increase in cells is present only in cases where there are frank manifestations of the central nervous system or whether it also occurs in the ordinary cases of mumps. This discrepancy might be explained by different interpretations of the clinical manifestations of the cases studied. It certainly seems probable however, from the findings that involvement of the central nervous system in mumps is much more frequent than most of us have ever suspected.

The diagnosis is not difficult when accompanying the symptoms of central nervous system involvment there is a parotitis and when one finds on lumbar puncture a clear spinal fluid with an increased cell count and without film formation. There are a number of conditions in which one sees similar spinal fluid findings. The more familiar of these being tuberculus meningitis in the spinal fluid of which a film forms, tubercle bacilli may be demonstrated, and the cell count is usually not over 150; poliomyelitis may give the same spinal fluid findings; syphilitic meningitis, the spinal fluid of which gives a positive Wassermann and finally lethargic encephalitis, and lead meningitis, the spinal fluids of which present nothing different from that of mumps meningitis, except that in the former the cell count is usually much lower, from normal to 200.

R. N. ANDREWS.

CEREBRO-SPINAL INVOLVMENT IN HEREDITARY SYPHILIS: Phillip Jeans (Am. Jour. Dis. of Child. Sept., 1919). In this paper it is intended to show that contrary to most current opinions, involvment of the central nervous system in hereditary syphilis is relatively common, and that by statistical study there is no difference in the incidents of central nervous involvments in hereditary and acquired syphilis. Since about one-third of all individuals with acquired syphilis show laboratory evidence of involvment of the central nervous system early in the disease and about the same proportion show more definite evidence of such involvment late in the disease, many syphilographers believe and with justification, that those who show early evidence of central nervous system involvment and perhaps only those are potential candidates for late neuro-syphilitic manifestations.

For some time a spinal puncture has been made routinely on all children with syphilis coming to the Washington University Dispensary. It was seen that the nervous system was involved in forty per cent of syphilitic infants. Of those having positive cerebro-spinal fluids slightly more than one-third of the infants and slighty more than two-thirds of the older children had clinical manifestations of neuro-syphilis at the time of observation.

Whether syphilis is hereditary or acquired, the earlier it is treated the better the prospect for complete cure. This is just as true for neuro-syphilis as for infection elsewhere in the body. In the great

majority of instances intravenous and intramuscular medication will result in the disappearance of the abnormal findings both in the cerebrospinal fluid and in the blood when such treatment is given early in the disease. Later in the disease these measures are often ineffectual, both clinically and serologically. Even the more drastic procedure of intraspinal therapy, though it may bring about a serologic cure, often leaves the clinical conditions unimproved. Every one realizes how discouraging is the prospect of cure or even of benefit in children showing evidence of parenchymatous and in many instances of late meningovascular involvment of the central nervous system. The time to treat neurosyphilis is before it is clinically manifested. This can be done in at least two-thirds of the instances of such involvments in infancy and in a considerable proportion at any age if we but take the trouble to examine the cerebrospinal fluid in any patient who has syphilis, whether there are any clinical indications for it or not. Justice to our syphilitic patients demands that the condition of the central nervous system, as evidenced by the cerebrospinal fluid, be known before they are discharged as cured.

R. N. Andrews.

THE CHLOROTIC TYPE OF ANEMIA IN INFANTS AND CHILDREN: Herman Schwarz and Nathan Rosenthal, (Arch. Ped., Jan., 1920) emphasize the frequency of severe anemias in infants and young children. They also show: 1. That a type of anemia corresponding in blood picture, at least, to the chlorosis of adults exists in infants and young children. 2. The administration of iron gives good results. Aside from the recognized anemia producing condition such as rickets, syphylis, tuberculosis, and helminthiasis the authors were able to collect forty cases, in a short time, in which the above causes were not found. Fourteen of these cases were in infants under three months of age. The greatest factors in the etiology were prematurity, twins and a stormy feeding history. The blood picture was one of Chlorosis. The authors carried out iron metabolism experiments which would seem to show a negative iron balance. However the problem is very complex and will require further study. But, as yet empirically, the authors found marked improvement in their cases in which iron was administered and they recommend it in addition to careful control of the diet.

F. C. Rodda.

HELIOTHERAPY: ITS GENERAL USE IN PEDIATRICS: William Parmer Lucas, (Arch. Ped., April, 1920) notes that the value of heliotherapy has been recognized since ancient times, Herodotus even having outlined the technique. There follows a dissertation on the physics of the sun's rays, the various kinds and actions of each type. All the rays possess the properties of heat, light and chemical action, though quantitatively different—the ultra-violet rays possessing the greater chemical activity and bactericidal properties.

The physicological action of the sun's rays is not as well understood as the physical. He quotes Rollier's observations, that exposure to the sun produces an increase of hemoglobin, red blood cells and the proportion of cosinophiles. The body temperature and respiratory rate also show changes. Pigmentation of the skin indicates tolerance for the ray. The following conditions are supposed to be benefited by heliotherapy, anemia, tuberculous peritonitis, adenitis, surgical and bone tuberculosis and as a procedure in convalescence. In certain types of pulmonary tuberculosis benefit is to be expected, though in acute forms or those in which hemorrhages prevail, it may do no harm. Sun exposures are not without danger and its employment must be carefully controlled. A detailed discussion of the technique of employing heliotherapy is given with a report of a series of the author's cases in which he found this method of therapy useful.

F. C. Rodda.

ROENTGENOLOGY

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RADIUM IN THE TREATMENT OF CARCINOMA OF THE CERVIX AND UTERUS: Russell H. Boggs. (Am. Jour. Roent., April, 1920.) During the past five or six years the treatment by radium of a large number of cases of carcinoma of the cervix and uterus has yielded results sufficiently good to bring the profession to accept radium not only as a palliative agent, but as a curative measure. The author makes the point that it is just as important to develop a radium technique as a surgical one, and that the best results will come to those who study every detail and check up their results with those of others. He also states that conservative statements on the part of roentgenologists and rather radical methods of treatment are advisable.

Bailey is quoted to the effect that "even the boldest operator can hardly hope to remove all the lymphatic tissues about the base of the bladder, in the parametrium beyond the uterus, or in the base of the utero-sacral ligaments"; and Janeway to the effect that "radium destroys the disease at a greater distance than the knife is capable of removing it" with no risk or inconvenience to the patient. Inasmuch as by any clinical test we are unable to determine extension into the pelvic lymphatic, it is urged that the only safe plan is to ray the pelvic glands in all cases, regardless of the stage of the disease.

After describing the chief characteristics of cancer arising in the fundus and that arising from the cervix. Boggs states that in a large percentage of hysterectomies performed after radium treatment, within 4 to 6 weeks no cancer cells were found in the cervix, but that in some cases there were traces of malignancy in the broad ligaments, and the consideration of the gynecologist is called to this ante-operative procedure even in early cases. When radium is used before operation, the operation should be performed within four to eight weeks before marked fibrous formation has taken place. The surgical results of the Wertheim operation are discussed, and the author voices his belief that proper local radium treatment, with sufficient cross-firing from radium packs or the x-rays from outside as an ante-operative measure, would cure many more cases.

Cancer of the cervix is divided clinically into four groups: (1) Early cases, limited to part of the cervix, with no extension to vaginal walls; (2) more advanced, but clinically still limited to the uterus; (3) with extension to vaginal wall; if there is no glandular involvement a high percentage may be cured by radium treatment; (4) with fixation of uterus, extension to one or both broad ligaments, involvement of vaginal wall and destruction of cervix; in many such cases there is glandular involvement and metastasis. The patients will often derive much benefit from radium, and frequently a local or clinical cure.

Boggs asserts that radium is a specific palliative in operable cancer of the cervix and uterus, that it will cure some cases and give subjective improvement in a number of others; that in many clinically cured cases recurrence will occur within two or three years, the patient meanwhile regaining normal health and leading a useful life; that if recurrence occurs, the patient suffers little in comparison with those who have not had radium, and that the offensive discharge usually disappears within 2 to 4 weeks.

Richey's description of his histological changes following radium is quoted; this and the results of Alter's study of 275 cases of squamous cell carcinoma of the cervix are used to support the author's deduction that operation should be performed 4 to 8 weeks after the radiation rather than immediately afterwards.

In describing his technique Boggs states that he has used radium locally with x-rays or radium externally, giving large doses of radium locally, and with the x-rays, using as many external ports of entry as practicable. The last few years he has been giving 3,000 to 4,000 milligram hours in the vagina, with one and one-half millimetres of brass and sufficient gauze and rubber to provide 15 mm. of filtration. Three tubes were employed, one directed towards the cervix, and one towards each broad ligament. The tubes were packed as far as possible away from the recto-vaginal wall, to lessen the danger of fistula. Whenever possible, radium was inserted into the cervical canal. The radium tubes in the cervix are filtered by one-half millimetre of silver, one millimetre of brass, and one to two millimetres of rubber. When 6,000 mg. hours are given at one treatment some discomfort may be produced; "but if we are going to treat primary cases without operation, rather heroic measures should be employed."

In discussing the conditions for the production of deep therapeutic effects with hard x-rays and gamma rays, Boggs quotes at length from a paper by Sir Ernest Rutherford on the "Penetrating Power of the X-radiation from a Coolidge Tube (Philosophical Magazine, Sept., 1917).

A. U. Desjardins.

MALIGNANT DISEASE OF THE LUNGS, ITS EARLY RECOGNITION AND PROGRESSIVE DEVELOPMENT, AS STUDIED BY THE ROENTGEN RAYS, WITH REMARKS ON TREATMENT: George E. Pfahler, (Ann. Surg., April, 1920.) The author states that malignant pulmonary conditions, formerly unrecognized before death in a large percentage of cases because of the indefinite symptoms and the general good condition of the patient, cannot be diagnosed in their earliest stages by any means, but hopes that, by intensive study, it may be possible to diagnose the disease much earlier than heretofore. He feels that at present many patients are operated upon at a time when metastasis in lungs and mediastinum is already present. A Roentgen examination should precede all operations for breast carcinoma and, if the findings are doubtful, operate.

Pulmonary malignancy is divided into primary and secondary (metastatic). Primary malignancy is rare and of two types: nodular and infiltrating. In the nodular type, the nodules develop near the roots of the lungs and also in the parenchyma. The nodules vary in size, are sharply defined and irregular in outline. The more common infiltrating type gradually invades the lung from the hilus region. This comes on so gradually and with such indefinite symptoms that the condition is not suspected until one side of the chest is entirely solid, with displacement of the heart and mediastinum to the opposite side, and with early pleural effusion.

The usual symptoms are: Pain, dyspnoea, with or without pleuritic friction, and dullness varying with the degree of involvement. Roentgen examination in the early stages will show a massive opacity about the root of the lung spreading toward the periphery. Sarcoma is especially apt to extend outward along the interlobar septum. In primary carcinoma the infiltrating mass about the root of the lungs spreads usually in an upward direction along the bronchial tree, whereas inflammatory conditions tend to spread downward.

Secondary malignancy is much more common than recognized. Warfield is quoted as having found metastasis in 178 out of 516 necropsies on persons having died of breast cancer. Pfahler thinks that in his studies the proportion would be even higher.

Metastatic sarcoma, more frequent after sarcoma (?) of the testicles, presents nodular, parenchymatous lesions, sharply defined and varying in size from a small pea to a walnut, and rarely larger. None of the patients studied had lung symptoms.

Metastatic carcinoma most frequently follows carcinoma of the breast, and Pfahler advocates a routine Roentgen examination of the chest in breast cancer. metastatic lesions are of four types: (7) the nodular parenchymatous vary greatly in size; they are not sharply outlined and suggest cotton balls. (2) the infiltrating type, the most common, begins as a general thickening about the hilus resembling inflammatory thickening but with more localized density, and gradually shading outward, with a tendency to extend toward the upper lobe. (3) the military infiltration consists of fine mottling throughout the lungs, the areas being a little larger, more dense and more sharply outlined, than in miliary tuberculosis. It is doubtful if the diagnosis can be made without careful correlation of the findings with the history. (4) progressive thickening of the pleura with effusion; this is probably a direct extension from the breast. The author discusses statistically the relative frequency of the different malignant types and states that approximately 50 per cent of the cases coming for post-operative roentgentherapy have metastatic chest carcinoma.

Roentgentherapy accomplishes some good, but in most cases, while there is temporary improvement for a period of months or a year, the disease takes on a more rapid form of development with evidence of general carcinomatosis followed by death. Progression of the disease frequently involves the spinal bones and the upper extremities of the humerus and femur.

A. U. Desjardins.

AN UNCOMMON CASE OF PLEURAL EFFUSION: Horace J. Howk and John A. Herring. (Am. Rev. Tuberc., Dec. 1919.) Male, age 29, had been under observation since Oct. 1914, with a diagnosis of tuberculosis involving the upper two-thirds of the right lung and the upper one-half of the left lung with manifest thickening of the right pleura at the base with persistent pleuritis which gave no symptoms.

On April 11, 1910 the man became severely prostrated with symptoms of diaphragmatic pleurisy. Fluoroscopic examination showed the right diaphragm to be elevated fully four fingerbreadths above the line of the left diaphragm. The left diaphragm moved up and down readily on respiration, but the right moved only slightly on deep inspiration. Stereoscopic X-ray plates of the chest showed at the base of the right lung a uniformly dense shadow, the upper border of which extended outward from the spine at the 9th v. s. and when two-thirds of the way to the periphery curved downward to the costal margin. This density appeared continuous with and of the same density as the liver. Its upper surface was smooth and gave the dome-like appearance of the upper surface of the liver. The heart was displaced to the left.

The impression was that something was crowding the diaphragm up from below and the dome-like upper surface of the shadow led them to believe that either the liver or some substance which was projecting upward the upper contour of the liver was responsible for the condition. Comparison with a previous case of known multiple abscess of the liver showed many points of resemblance on the x-ray plates.

The next day a superficial dullness was found extending throughout the right chest from apex to base. Aspiration revealed a clear serous effusion. There had been an extension of effusion throughout the right pleural cavity after rupture of the adhesions confining it to the base. Their theory respecting the definite and confusing limitation of the effusion is that bands of tissue resulting from a prolonged pleuritis held the fluid within strict bounds and that only by coincidence did they take the contour of the upper border of the liver.

R. G. Allison.

THE RADIOGRAPHIC FINDINGS IN PERICARDITIS WITH EFFUSION: George W. Holmes. (Am. Jour. Roent., January, 1920.) Attempts from both clinical and experimental studies to solve three problems: (1) Is the shadow of the heart visible within the fluid filled pericardium; (2) what effect does fluid have upon the visibility of the heart beat; (3) what effect has fluid in the pericardial sac upon the shape of the cardiac shadow?

Experiment 1. Visibility of dog heart when immersed in fluids of varying specific gravity. The outline of the heart when suspended in: Air is very sharply defined. Ether is not so distinct but can be readily made out. Water is barely visible. Salt solution, specific gravity 1012-1020, it is impossible to identify the cardiac outline. Salt solution, specific gravity 1036, the heart again is visible but its density is less than the fluid in which it is suspended.

He assumed from the experiment that the specific gravity of the living heart filled with blood is not far outside the range of 1012-1020.

Experiment 2. Injected 150 Cc. of fresh ascitic fluid of specific gravity 1012 into the pericardial sac of a living dog. After the injection the cardiac outline was more rounded, the cardio-hepatic angle was not obliterated, and the heart could not be made out within the shadow of the distended pericardium.

Experiment 3. Injected 200 Cc. of salt solution

specific gravity 1012 into pericardial sac of cases coming to autopsy. Plates made with the subject in prone position showed that the curves at the junction of the heart and the great vessels were straightened out but with no other apparent change in the outline.

Clinical studies: Heart shadows were very much enlarged and there was a definite change in shape with change in position of the patient. Study gives the impression that the absence or presence of pulsation in the individual case depends somewhat upon the amount of fluid present. The greater the amount of fluid the less likely we are to see pulsations. The cardiohepatic angle was sometimes acute, sometimes obtuse, and sometimes obliterated. The angle is more likely to be obliterated if the examination is made with the patient in the upright position. There is an absence of the normal outline of the various chambers of the heart. He was unable to get much data on the effect of the fluid on the triangle back of the heart and in no case was he able to see clearly the diaphragm on the left side.

Summary is made of the findings in pericarditis with effusion and grouped in the order of their importance: (1) An abnormally shaped heart shadow which changes with change of position of patient. (2) Obliteration of the normal heart outline. (3) Change in shape of the angle formed by the posterior border of the heart, the diaphragm, and the spine. (4) Faint or absent pulsations.

R. G. Allison.

BOOK REVIEWS

GERIATRICS. By M. W. Thewils, M. D. C. V. Mosby Co., St. Louis, 1919, $3.00.

Senility is a physiologic state like childhood: not a pathologic state of maturity. Diseases in senility are pathologic conditions in a normally degenerating body: not diseases such as occur in maturity complicated by degenerations. With these thoughts in mind the author attacks his problem. He bases his therapy upon them and with the frequent use of illustrative cases succeeds in developing a very readable text. Portions of it contain statements which tax one's credulity, as for example in the treatment of two hundred cases of senile prostatic enlargment the author has never had recourse to catheter life for two weeks and never advised an operation or had a patient who had been operated upon for this condition. Would that we were all so blessed! In the treatment of the above mentioned conditions stress is laid upon the efficiency of chromium sulphate, a drug of very doubtful potency which the texts on therapeutics bearly deign to mention. Aside from the rather startling mixtures which he prescribes in treatment, and the use of many drugs whose therapeutic effect is doubtful, his general directions in the hygenic management of the cases is sound and logical. He approaches the subjects in hand with a proper attention to the pathology of the conditions existing and his therapeutic efforts are attempts to remedy them. The chapters on senile dementia and the sexual life of the aged are explicit enough to be read by the general practitioner and it will be a distinct relief to the specialist to read a simple expostion of a mental state without having it completely enshrouded and mystified by hypothetical conjectures and pseudo-scientific verbiage.

Frank W. Whitmore.

DIET IN HEALTH AND DISEASE. By Julius Friedenwald, M. D., Professor of Gastro-Enterology in the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore; and John Ruhrah, M. D., Professor of Diseases of Children in the University of Maryland and College of Physicians and Surgeons, Baltimore. Fifth edition. Philadelphia and London. W. B. Saunders Company, 1919. $6.00.

In all its phases this edition rivals with the best books that have been written on any one of the many topics which are here concisely yet comprehensively considered. It may well serve not only as a text book for the general practitioner, hospital interne, and medical student, but it will also fulfill all the needs and requirements of a reference book. Although not voluminous, it has over 900 pages.

A careful and detailed discussion of its merits goes far beyond the scope of this brief review. Special emphasis must be placed on its practical nature. The kinds of foods with their composition, uses and guiding principles both in health and disease have received the most careful deliberation. In compiling this work, the authors having surveyed the literature to the present moment, have incorporated the most recent parts, such as diet lists, recipes, vitamines, and the amino acids, alkali and acid content of the food. Sippy's diet in peptic ulcer is outlined in detail and diabetes, obesity, acidosis, and the deficiency diseases constitute a very prominent part of the work. Dr. Locke's analysis of diabetic foods with other valuable tables too numerous to be mentioned are duly embraced in the volume.

In chapter sequence the book imparts information concerning the chemistry and physiology of digestion, classes of foods, beverages and stimulants, infant feeding, diet for special conditions, special methods of feeding, diet in disease, special diets, dietetic management of surgical cases, army and navy rations, dietaries in public institutions, recipes and chemical composition of American foods. It also contains a rapid reference diet list, sample pamphlet of information for distribution among the poor in summer, weights and measures, and Locke's tables of food values.

It is to be regretted that chapters dealing with the special methods of feeding and diet for special conditions are repeated whole or in part, otherwise, the book in thought and form is most commendable.

J. A. Lepak.

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DIAGNOSIS IN INJURY OF THE PERIPHERAL NERVES*

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Aside from the functional neuroses, no condition with which the neurologist has had to deal has appeared so frequently in the late war as injuries of the peripheral nerves and this very large number of cases has offered not only an unprecedented opportunity for the study of the symptoms but also a great problem in respect to their care.

The restoration of an injured nerve to normal offers certain difficulties and peculiarities which distinguish the problem from that found in any other kind of plastic surgery. There is nothing in the physiological equipment of the individual comparable, for example, with compensatory circulation of the blood, on which the patient can fall back in case of interruption of a nerve. Moreover, the restoration to normal of continuity in a nerve, though an absolute essential to cure, is no guarantee that the nerve will function, in which again the condition is altogether dissimilar from that seen in such a condition as fractured bone. The approximation of the ends of the severed nerve and their subsequent healing results merely in the restoration of the frame work and, if function is to follow, the nerve fibers must find their way down the old nerve sheath and effect an approximation with their essential end organs and this through tissues to which the nerves are alien. It is important to remember that the nerves have their origin in parts far away from those in which they ultimately come to lie and carry on their activity and though this penetration of foreign tissue may occur readily in intrauterine life, it is probably a very difficult problem in adult life. Finally, the destruction of a part of the shaft of a bone or of a portion of the vessels of some one part of the body, even though no improvement may subsequently occur, is not necessarily disabling, whereas, an injury, with partial destruction of a nerve, may result in a condition so painful as to be even much worse than if the nerve were totally severed.

Eighteen to twenty per cent of all injuries to limbs in war time is accompanied by peripheral nerve wounds, and among these certain nerves are involved much oftener than others. The musculo-spiral nerve is most often injured, quite fifty per cent oftener than any other, due to its intimate relation with the humerus, which is often fractured with secondary involvement of the nerve. The ulnar nerve is next most often involved, with the median and sciatic closely following. The external and internal popliteal, the circumflex, and the brachial plexus are not infrequently injured. It is very common also to find a combination of nerve injuries, though usually some one nerve is more seriously involved than the others.

The different lesions which may be found in the individual nerves are: 1. Interruption,

Fig. I. Atrophy of the interossei in ulnar nerve lesion.

*Read before the Minnesota State Medical Association, October, 1919, Minneapolis, Minn.

Fig. 2. Palmar view of same case. Note the atrophy of the hypothenar eminence and the flexion of the second phalanx (superficial flexor) of the fourth and fifth fingers.

partial or complete; 2. Compression; 3. Irritation. Finally we have a syndrome of regeneration.

Ordinarily the first symptom following a serious injury to a nerve is a complete loss of motion and sensation in the entire limb below the seat of injury; quite comparable to a hysterical, or glove or stocking anaesthesia. This lasts for a variable period of a few hours to two or three days and the patient then becomes aware of a certain more or less clearly defined loss of motion and sensation, and the syndrome is established.

The important points to be determineded in the clinical examination of any nerve injury are: Is there a nerve injury and if so of what nerve or nerves? What is the nature of the injury; interruption, compression, or irritation? Is regeneration occurring? What shall the treatment be, especially the surgical treatment?

Fig. 3. Musculo-spiral paralysis with loss of power of extension of hand and fingers and loss of contraction of the supinator longus. Note the wound above the elbow.

Fig. 4. Musculo-spiral paralysis with wound below the point of innervation of the supinator longus and preservation of power of contraction of that muscle.

To determine the presence of an injury and the nerve involved implies a certain knowledge of the anatomy and physiology of the nerves and muscles of the affected part, the more complete the knowledge the more easy and satisfactory the diagnosis. The examination should be complete and methodical. Otherwise, serious nerve complications may be overlooked in the presence of other injuries.

It will be impossible in the time at my disposal to enter into all the clinical symptoms and signs of nerve involvement and I shall confine myself therefore to the more important, namely: disturbances of motion and of sensation, vasomotor and trophic disturbances and disturbances of the reflexes and of the electric responses and the objective examination of the nerve:

Loss of power of motion is one of the most characteristic signs of a nerve lesion and varies

Fig. 5. Musculo-spiral paralysis with dorsal swelling of the carpus due to teno-synovitis of trophic origin.

Fig. 6. Atrophy of the thenar eminence in median paralysis.

from partial loss to complete paralysis. Certain precautions must be taken in making a motor test. Thus, we must make sure that the loss of movement is not due to the contraction of antagonistic muscles and we must be very sure that compensatory movements are not obscuring a real paralysis. Also, if a movement is to take plaee in any unfavorable direction, so that the muscle must move the limb against the influence of gravity, a mere weakening of a musele may easily be mistaken for a complete paralysis. Thus, a weak biceps may flex the forearm on the arm when the arm is held in a horizontal position but be quite unable to effect any movement if it must raise the forearm against the influenee of gravity. In the same way if the extensors of the hand on the wrist are weak, their action may be shown only where the hand is held half

Fig. 7. Causalgia in median nerve injury.

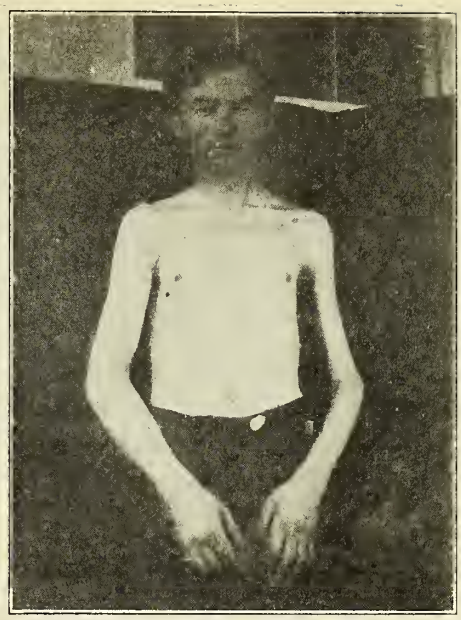

Fig. 8. Injury of the left brachial plexus with total radicular paralysis.

way between pronation and supination. In other words, in determining the presence of very slight motor power, we must employ zero positions by whieh is meant that attitude for each muscular group in which the feeblest movements may be detected.

Inability to perform a movement due to contraction of antagonist muscles or to a stiff joint is easily ascertained by attempting passive movements.

Substitution or compensatory movements are very commonly seen in peripheral nerve injuries. Thus, adduction of the fingers is accomplished by the palmar interossei and abduction by the dorsal interossei, both of whieh groups of muscles

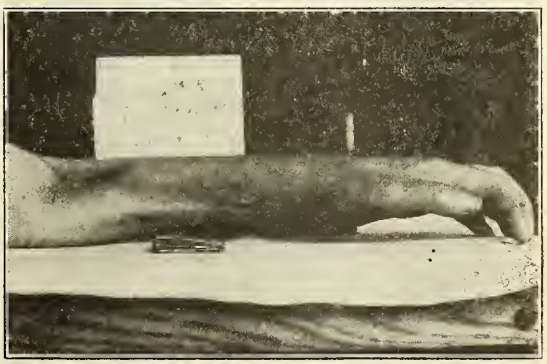

Fig. 9. Ischaemic paralysis following the application of a too-tight cast, with sloughing of the soft tissues of the forearm.

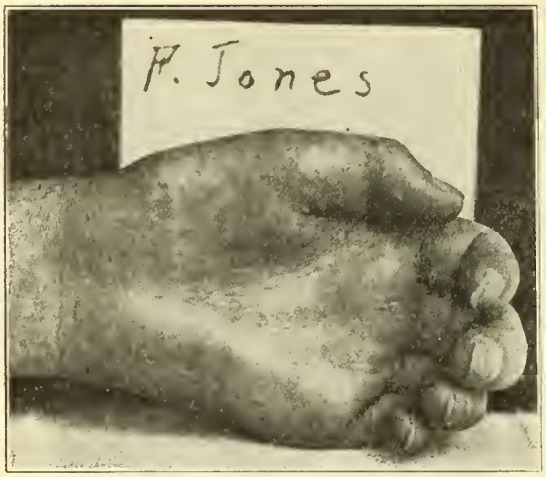

Fig. 10. Ischaemic paralysis following injury to arteries supplying the arm.

are supplied by the ulnar nerve, yet in complete ulnar paralysis both movements may be preserved to a considerable degree, for the extensors of the fingers may serve as abductors and the flexors as adductors in an emergency. In fact, the only movement, ordinarily performed through the ulnar nerve, which cannot possibly be simulated is adduction of the little finger. Only careful observation and interpretation of movements permits one to detect these substitution phenomena.

Finally, there may be no movement because of lack of effort on the part of the patient due

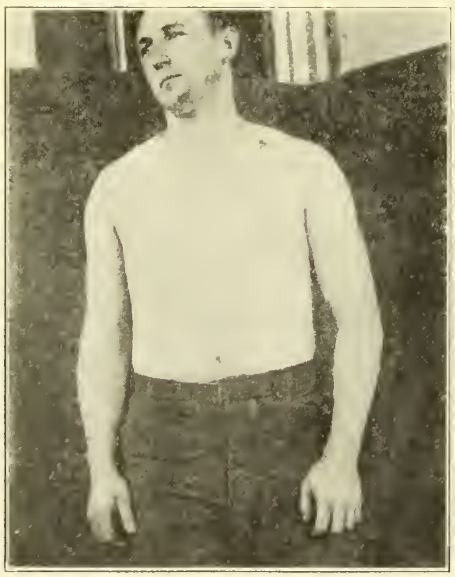

Fig. 11. Hysterical motor and sensory paralysis of the left arm due to an injury above the level of the left brachial plexus. (See Fig. 22.)

Fig. 12. Paralysis of the right external and internal popliteal.

to conviction of inability to accomplish the act, to malingering or to hysteria. If in any case of apparent attempted movement on the part of the patient there is not a synergic contraction of neighboring and antagonistic muscles one may suspect an artificial incapacity and in such a case a faradic current should always be tried. In genuine paralysis, not of cerebral origin, the faradic response is always lost save in a very few cases of slight compression as for example in some instances of crutch paralysis.

Following a nerve injury there is usually a definite area of sensory loss, marked in ulnar, median, sciatic, and external and internal popliteal, and relatively slight in musculo-spiral injuries. There are several different kinds of sensory loss, and one cannot enter into a discussion of all, but it is at least necessary to distinguish clearly between superficial or cutaneous and deep sensibility. The outlines one sees ordinarily on the skin, represent superficial, not deep, sensibility, and are made by cotton or camels' hair touch and by pin prick and instruments for determining temperature. Deep sensibility is supplied by other nerves and is determined by testing the sensibility to pressure, the sense of attitude and the presence of bone sensibility, and is much less useful in diagnosis of nerve injuries than is superficial sensibility.

Usually a patient tests his own sensibility by

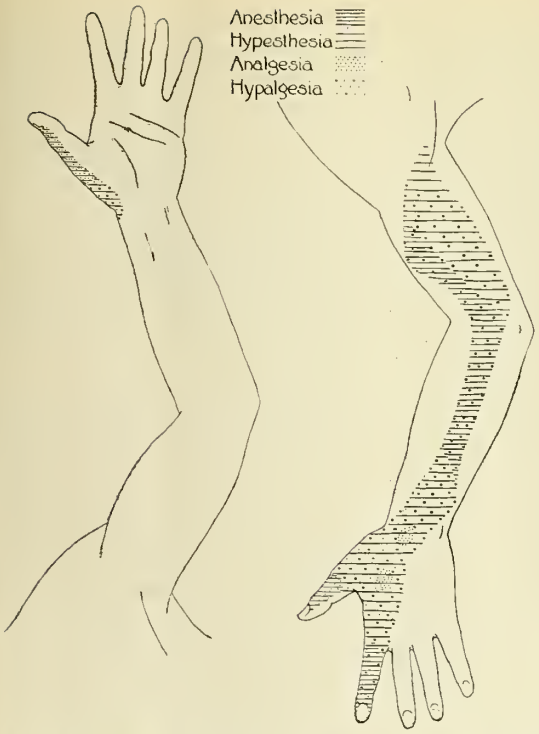

Fig. 13. Typical area of sensory loss in high musclo-spiral paralysis.

pressing or rubbing the part with his fingers, which naturally tests deep sensibility, and if he gets a sensation he is likely to assume that there is no loss of feeling, even when superficial sensibility is greatly or wholly impaired.

For careful examination it is necessary to shave the part and to test with either cotton or camel's hair brush, with pin prick, with pressure and with joint movements, and with instruments for determining temperature and vibration sensibility. For ordinary clinical purposes a pin point will usually suffice and by means of it we may detect fairly accurately touch, pain and pressure. For rough clinical purposes one may also use stroking touch which is said by Trotter and Davis* to give the widest outline and most delicate response.

Besides loss or diminution of sensibility, one must look for increased sensibility to cotton, prick, or other test, and patients will often speak of the pin as giving a more or less numb feeling and yet "hurting more"; in other words, a painful hypoaesthesia, the most frequent form of paraesthsia found in nerve irritation. Involuntarily the part is jerked away when the pin is applied to such an area. This condition, known as causalgia, occurs especially in injuries of the median nerve and was, in three of our cases, the source of the most excruiating pain.

Vasomotor changes occur in practically all nerve injuries whereas trophic changes are much more common in nerve irritations than in interruption or compression. Cyanosis and redness in the affected area of the extremities is almost constant. Oedema is also frequently seen and hypertrichosis occurs. In interruption or compression of nerves, a transverse grove usually appears in the nail marking the time at which the injury occurred but in nerve irritations much more striking changes may occur in the nails. A dry skin, rarely with a branny desquamation, occurs in most nerve sections but in nerve irritations there is often excessive sweating. It is said that in a severed nerve, with subsequent healing, the loss of sweating is the last abnormality to disappear in the affected area. The skin is also often smooth or even glossy and shows a notable loss of the cutaneous folds and papillary crests, which change again is much more marked in nerve irritations than in nerve sections. The skin has a peculiar fibrous feeling and may be adherent to the underlying tissue, to which this trophic change may extend, so that there is a

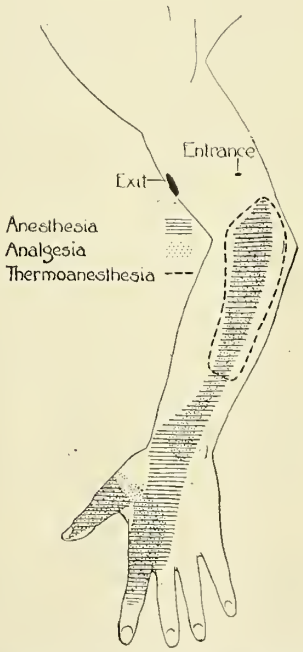

Fig. 14. Sensory loss in musculo-spiral paralysis from wound midway in upper arm.

*Brain: Vol. XXXVIII, Nos. 2 and 3, p. 134-247. Feb. 9, 1909.

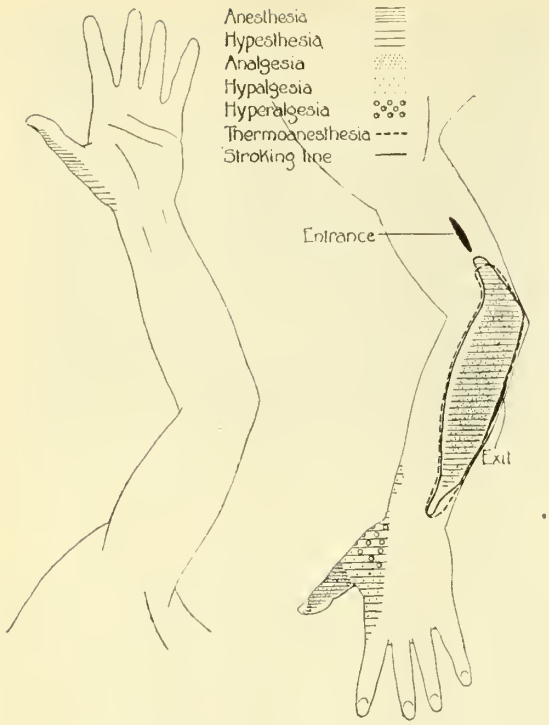

Fig. 15. Unusual area of sensory loss in musculospiral paralysis from wound midway in upper arm.

thickening and contraction of the tendon sheaths and of the fascia, producing peculiar claw like appearances in the hands and deformities in the feet. Osseous decalcification is not uncommon.

Muscular atrophy occurs in injury of all nerves containing motor fibers. It appears after two or three weeks, develops rather slowly, is worse in irritation than in section of the nerves and persists long after motion has reappeared. In complete section of the nerve there is marked loss of tone in the muscles and a loss of pain sensibility on deep pressure. In nerve irritation, on the contrary, there is often hypertonus of the muscles and marked increase of pain on pressure.

Tapping over a normal muscle fasciculus produces a local and momentary swelling of the part, with a resulting movement. This is known as the idiomuscular reflex and is usually increased in peripheral nerve lesions, even though complete. It gradually fades out as the muscle atrophies.

The tendon or deep reflexes are always lost in true paralysis of peripheral nerve origin and retention of the reflex is evidence of either a central or a psychic paralysis.

Electrical testing is an important part of the examination of any peripheral nerve injury. The presence of a faradic response readily distinguishes such cases as hysteria and malingering but all forms of electric tests, when used in large groups of soldiers, have not sufficed to make a positive diagnosis as between the cases of complete loss of function, with compression only, of the nerve and loss of function with loss of continuity, the most frequently recurring, difficult diagnosis to be made in a group of peripheral nerve injuries.

Pressure on a severed nerve trunk, below the seat of section or compression, produces no sensation but pressure on an irritated nerve trunk is painful throughout the entire course of the nerve below the lesion. This pain on pressure must be differentiated from formication on tapping over the severed nerve trunk, known as Tinel's sign or D. T. P. (distal tingling on percussion), an evidence of axis cylinder regeneration. If a nerve trunk is tapped just below the seat of injury and shortly after the nerve is severed, no sensation is induced but if healing of the nerve occurs and the tapping is renewed about four to six weeks after the injury, a

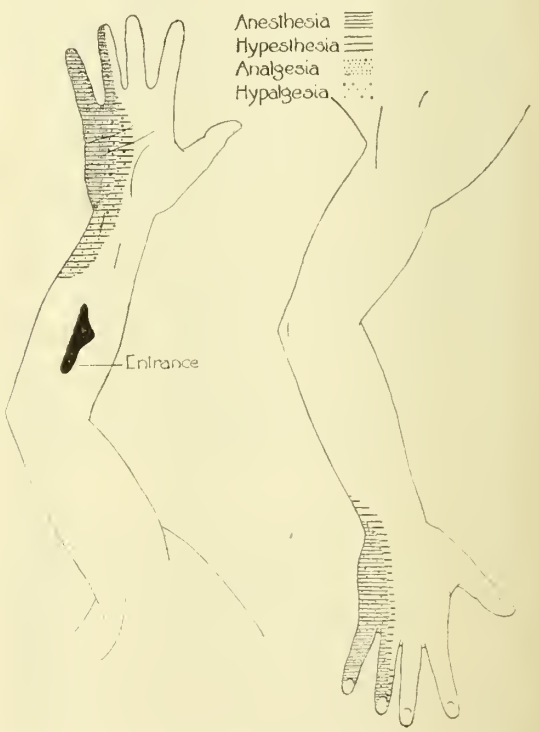

Fig. 16. Loss of sensation in hand and lower part of forearm due to injury to ulnar nerve in middle of forearm.

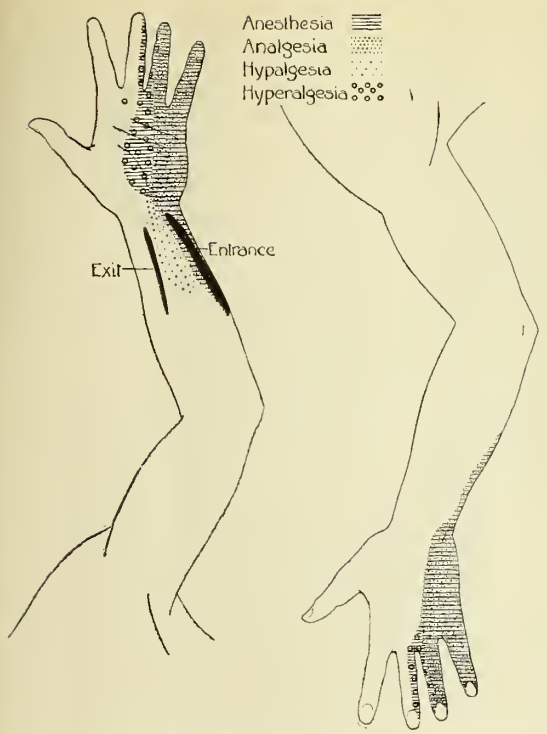

Fig. 17. Wider area of sensory loss from injury to ulnar nerve at the wrist.

peculiar tingling is felt, described by the patient as like electricity, not at the point of tapping but at the peripheral distribution of the nerve. This is Tinel's sign and is by him, in his most excellent book, regarded as of supreme importance, indicating the downward growth of new axis cylinders. As these, under ordinary conditions of healing, grow down the limb at the rate of one to one and a half m. m. per day, the production of this phenomenon at successively lower levels was interpreted by Tinel as proof of a satisfactorily healing nerve. The tapping should be done gently and from below upward and a record kept of the point at which it appears on successive examinations. Unfortunately the sign has not, in practice, been found to possess the value first claimed for it. Either its significance has been wholly misinterpreted or else it is possible for a very few axis cylinders, growing downward, to induce it, quite insufficient in numbers to result in any return of function to the affected part. At least in my experience it has frequently been possible to demonstrate the steady downward growth of the phenomenon in cases when there was no return of function to the part involved even after many months of watchful waiting.

In connection with the direct examination of the nerve one should look for a neuroma, a more or less bulky thickening of a nerve, at its point of injury, made up of twisted and rolled up axis cylinders. When a nerve is severed the two ends tend to coaptate and the central end tends to grow into the peripheral, attracted by the neurotropism of the latter. If there be an obstacle as a dense scar, then the axis cylinders above can only roll up into a ball constituting a true neuroma.

On the peripheral end of the severed nerve another swelling occurs but this is merely a mass of neuroglial cells, contains no axis cylinders and is known as a glioma or false neuroma. A nerve, merely contused, is likely to produce a swelling in the course of its trunk which in this instance is a false neuroma.

The finding of a neuroma, therefore, locates the lesion but does not tell if there is complete separation. If a distal swelling can also be palpated we are certain of a separation, either partial or complete. In either case the presence of the neuroma or neuromata does not tell us whether regeneration is occurring.

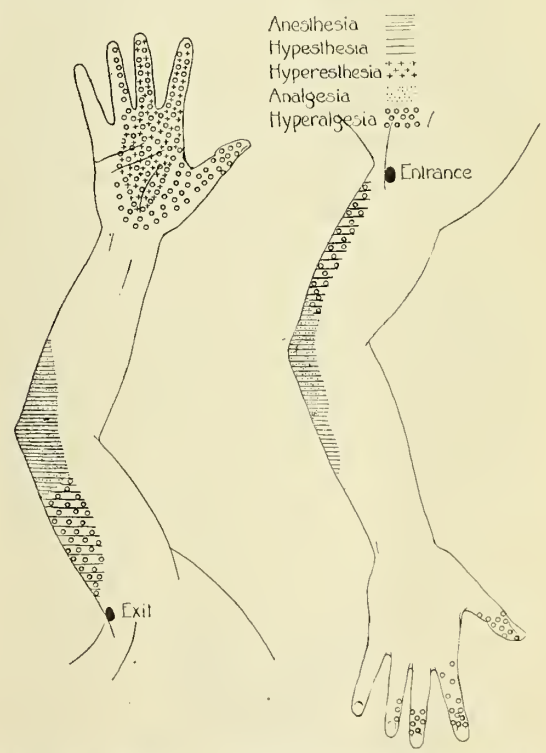

Fig. 18. Sensory disturbance (causalgia) from gunshot wound in the region of the axilla involving the median and internal and lesser internal cutaneous nerves.

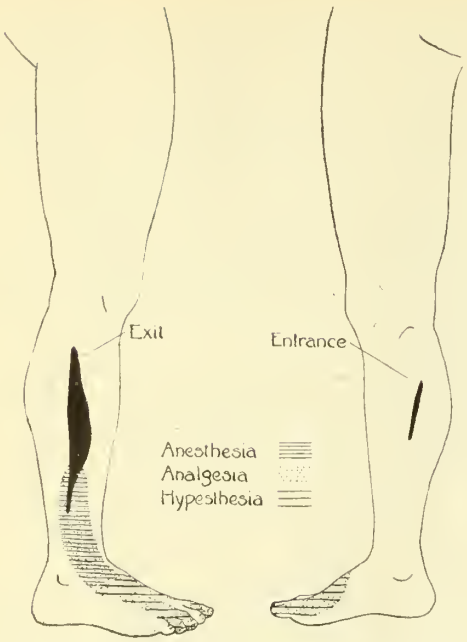

Fig. 19. Sensory loss in injury of the peroneal cutaneous and musculo-cutaneous nerves. Anterior tibial not involved.

If these statements are correct, it is apparent that though the diagnosis of the presence of a nerve injury is not a particularly difficult matter, the character of that injury, especially as regards the difference between physiologic and anatomic discontinuity, is often a very difficult matter. The return of voluntary movement, assuming that we have carefully excluded substitution movements, is the most reliable sign of a healing nerve and almost the only single sign that can be absolutely relied upon, yet a careful and complete examination and an intelligent consideration of all the phenomena that can be brought out suffices to make an accurate diagnosis in most of the cases. There remains a certain small number, however, in which the spread of a Tinel sign or the gradual disappearance of the sensory loss or the presence of other signs leads one to believe that healing is occurring yet no return of motion occurs and in the end one is forced to operate and the operation may show a completely severed nerve with no microscopic evidence of any tendency to heal.

Remembering that the healing of a nerve is a slow process and that even after the axis cylinders have grown down to their ultimate termination, time must be given them to effect a proper connection with their appropriate end organs before function can be restored, it is obvious that one cannot speak with any certainty as to prognosis in severe cases except those that have been long under observation. To one who sees these patients for the first time and remembering the rather conservative views that have been generally held as to the results of peripheral nerve surgery, they appear a rather hopeless lot. It is decidedly encouraging then to see the relatively large number who, with signs of a complete physiologic block but of course without loss of anatomical continuity, after a few weeks or a few months begin to show signs of satisfactory improvement and ultimately fully recover. Certainly well over half of the patients that came under my observation recovered or were apparently satisfactorily recovering at the last time I saw them. Tinel gives the percentage of spontaneous recoveries as between sixty and seventy. Of the operated cases, the most satisfactory are those where only liberation of the nerve from scar tissue is needed and in them the recovery is at times surprisingly rapid. Of the cases that were operated for complete nerve section, very few were under my observation sufficiently long to determine the

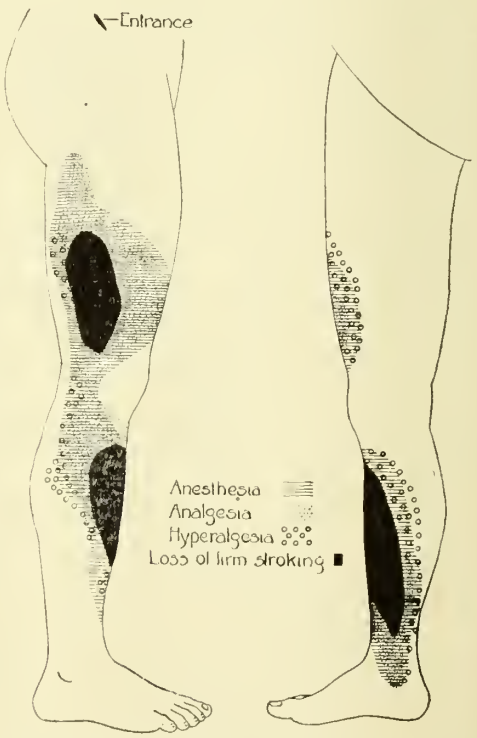

Fig. 20. Peculiar sensory disturbance in injury of the anterior crural nerve.

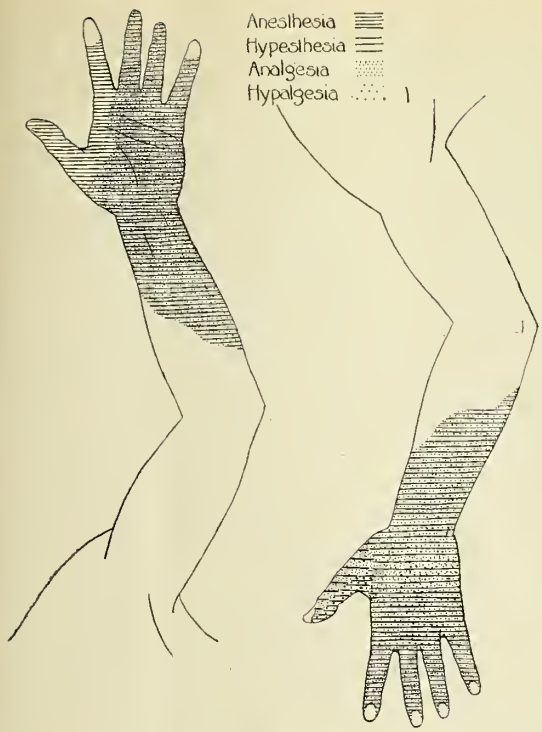

Fig. 21. Hysterical loss of sensibility in the arm and hand following fright in battle.

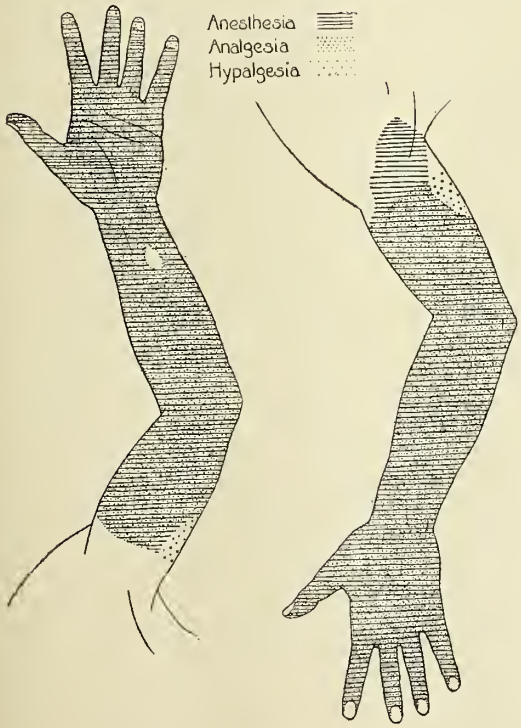

Fig. 22. Hysterical loss of motion and sensation in the hand and arm following injury above the brachial plexus. (See Fig. 6.)

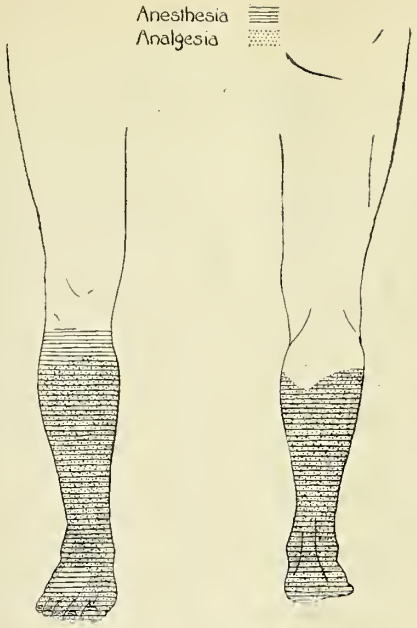

Fig. 23. Hysterical loss of sensation in the feet and legs.
Note the peculiar areas of sensory loss in hysterical cases.

result. Yet in a few older cases, there had been a very definite improvemnt, both motor and sensory, at the last time I saw them and one had every reason to expect their ultimate cure and, if this restoration can occur in some cases, there seems no reason to doubt it will occur in others, assuming of course that the individual is otherwise healthy and that the ends of the nerve can be brought together in the midst of healthy tissue and without undue tension.

I saw no case of nerve transplantation which showed positive signs of healing but it must be added that none of these observed by me had been operated sufficiently long to permit of such evidence and some of them did show sensory improvement and the presence of a Tinel sign.

PERIPHERAL NERVE INJURIES*

By J. F. Corbett, M. D., F. A. C. S.
Minneapolis, Minn.

The late war has given abundant opportunity to study peripheral nerve injuries. The experience has taught that in one hundred cases of palsy from war wounds about sixty or eighty cases recovered without operation if given proper mechanical, postural and electrical treatment. In the remaining twenty to forty, operative procedure was necessary. The cases due to recover spontaneously can not often be determined until a considerable period of time has elapsed. Both may exhibit flaccid paralysis, loss of sensation, reaction of degeneration, absence of reflexes and atrophy. Careful neurological examinations, often repeated, will determine whether these conditions are stationary. When they are stationary for three months after healing is completed, operation is indicated. The Tinel sign is of doubtful value when the exact type of lesions is unknown. One may get the Tinel sign in nerves that are almost completely divided, provided a few fibres have escaped destruction. After operation the Tinel sign usually is of value, especially if positive. On the other hand, a negative Tinel does not furnish sufficient indication for a second exploration. Early exploration done by the German military surgeons in the first part of the war has furnished a foundation for a statement concerning the underlying pathology of the lesions due to undergo spontaneous recovery, the so-called physiological interruption.

Tubby has applied the term "concussion of the nerve" to a form of physiological interruption. "It is damage done to a nerve-trunk without actual destruction of axis cylinders, and the damage may consist of an effusion of blood between the fibers following compression of a nerve against bone by the rapid passage of a foreign body in the immediate neighborhood of the nerve. In other cases actual lesion may not amount to hemorrhage but to a temporary anemia, or its opposite, hyperemia."

Heile and Hezel state if the nerve be grazed by a bullet, that an inflammatory exudate may occur in the nerve, causing the contour of the nerve to be altered. The diameter of the swollen nerve may be three times that of the normal nerve. In time this exudate is absorbed, leaving behind more or less intraneural scar tissue and adhesions to nerve sheath. The amount of connective tissue determines whether the interruption is physiological or anatomical.

Those cases where no spontaneous recovery could occur are due to either one of two causes, —first, complete interruption of the nerve trunk; and second, a binding down of nerve tissue either by scar tissue, bony callus, or some foreign body. Frequently, such conditions occur in the neighborhood of fractures. Liberation of extra-neural scar tissue is followed by almost immediate recovery. In this connection there is one type of lesion that I wish to caution against. On two occasions I have found the sciatic nerve to be bound down by a heavy sheet of extraneural scar tissue. The temptation was very strong to simply remove the band of scar tissue and stop at that point. However, in both these cases, inside the nerves were discovered masses of scar tissue whose presence had been concealed by a thin zone of normal tissue. These intraneural keloids are very deceptive, and any nerve that does not respond to stimulation by the Bristoe coil should be carefully explored at the time. The appearance of the external wound often is deceptive. Extensive scar tissue over the course of a nerve does not always preclude the possibility of spontaneous regeneration.

One hundred and two days after healing was the average time for beginning return of voluntary motion in paralysis of the musculospiral. In two cases the voluntary motion began to manifest itself at the end of one hundred and fifty days after complete healing. In one of these the wound had healed in fifteen days. Some of these cases were delayed in recurrence of voluntary motion from the fact that the disability was caused more from overstretching of the paralyzed muscles than from the nerve lesion itself. It was a common thing to get return of voluntary motion soon after proper postural treatment had been carried out when that factor had been neglected. Splint-

*Read before the Minnesota State Medical Meeting, Oct. 1-3, 1919, Minneapolis, Minn.

ing, massage, properly directed passive movements and electricity are of fundamental importance. Of the splints I wish to mention our own plaster-molded cock-up splint for the musculospiral and the napkin ring splint for ulnar paralysis. In addition, a right angle external stop splint for foot drop and the arm abduction splint were commonly used. In place of stock splints our best results were obtained when the appliances were made to fit each individual case. The plaster molded cock-up splint was so made as to relax the extensor tendons of the wrist, thumb and fingers; to preserve the arch of the hand; and to allow of all normal muscle action. These were molded to fit the hand placed in the proper position, and after setting were removed, baked and varnished, so as to render them waterproof. The ulnar splint was made of aluminum and consisted of a plate so bent as to fit the outside of the hand. Full flexion of the fingers was possible, but hyperextension or stretching of the interossei was prevented. All splints were removed daily, and massage, electricity and passive movements were employed. These must be intelligently directed so as to avoid stretching of paralyzed muscles. The masseuse should have a knowledge of the anatomy of the parts treated, or else be furnished with iron-clad instructions for each type of paralysis. Hot water and radiant heat proved themselves of great value. However, the skin in these palsied extremities is very easily burned.

Anatomical interruptions described by various authors may range anywhere from severance of a nerve with separation of its ends to complete fusion of nerve ends in gigantic masses of scar tissue. Every cut nerve when allowed to heal, whether completely severed or not, presents an enlarged bulb at the site of injury springing from the proximal segment. This is known as a neuroma. The neuroma consists of the local proliferation and entanglement of regenerated nerve fibers. It represents an attempt of the axis cylinders to penetrate the connective tissue simultaneously forming. Some of the fibers are strangled, others are deflected and may form Perroncito spirals. Tinel considers tumors formed by thickening of the envelopes, by hemorrhagic or fibrous infiltration of the nerve, or by neurological elements to be pseudoneuromata.

When a nerve is anatomically interrupted, certain changes take place in the nerve proceeding from the lesion peripherally so far as the nerve distributes. These changes, first described by Waller in 1850 and amplified by Ranvier in 1873, by Beneke in 1872, and by Huber and Howell in 1892, and finally by Ransom in 1912, are commonly referred to as wallerian degeneration. This consists of at least three distinct processes; first, change and fragmentation of axis cylinders; second, myelin change and absorption; third, changes in the syncytial cells of Schwann. The last process is emphasized in studies on regeneration. Soon after section of a nerve the cells beneath the neurilemma begin to hypertrophy, sending out processes of protoplasm. Numerous nuclei resulting from mitosis soon appear in these bands. These protoplasmic, many nucleated masses, are known as protoplasmic bands. Attention was called to them by Bunger in 1891. Howell and Huber described embryonic bands or embryonic nerve fibers in 1892. Lewis considers these protoplasmic bands to be essential to nerve regeneration in that they form a conducting pathway. Ingebrigtsen has shown the possibility of axis cylinder growth in plasma, and Clark has found regeneration of nerves in beriberi without change in the neurilemma. Axis cylinders, according to Huber, have some power of penetrating scar tissue. Spontaneous repair of severed nerves has been recorded where a considerable gap had to be bridged. Notta's case is an example. Notwithstanding the above exceptions, the new conduits formed by protoplasmic bands offer the best channel regeneration. Korybutt-Daskiewicz considered the proliferated sheaths of Schwann as anlage for new axis cylinders.

In complete section of a nerve there is not only intraneural formation of scar tissue reaching to a considerable extent into the nerve, but there is usually actual separation of the ends due to either destruction of nerve substance or retraction of the nerve. Usually there is extensive scar tissue all about the nerve. This has been attributed to infection, but great amounts of scar tissue are found in nerve

avulsions where there has been no external wound. In the latter case the presence of scar tissue can best be explained as a result of hemorrhage. Oftentimes, at the site of a gunshot wound there is no normal anatomy left. Dujarier described three zones in nerve wounds: (a) neurofibrome; (b) zone adherente: (c) zone libre. The neurofibromata may be of considerable size, while the zone adherente may be a mass of indistinquishable scar ten or fifteen centimetres in length. Such damaged nerves can only be found by starting dissection in normal structures in either side of the scar tissue area.

Not only are dissections difficult, but the nerve may actually be carried out of its course. The impact of the projectile, drainage tubes, packing and probing, probably all contribute to this. I have found one end of the ulnar nerve fastened to the bone, the distal end being attached to the skin. The dissection must be started in normal fascial planes both above and below the injury. Fascial planes can often be followed even when intimately bound together if any trace of them remains at all. Sharp knife dissection and instrumental technic are absolutely essential. Under these conditions, hemorrhage is troublesome but can be controlled with water at 120 F., used in a Gentile syringe or applied on pledgets of cotton. Often extensive dissection can be done with no hemorrhage. When escape of blood does occur, it can be removed by washing it out with Ringer's solution. Hemostasis must be perfect and the wound must be washed free of blood, else scar tissue will re-occur. With the two parts of the nerve exposed the two dissections are united. This dissection of scar tissue necessarily leaves a raw surface. These raw surfaces must be infolded so as to leave all surfaces of the wound covered with fascia that are destined to serve as a bed for the nerve. This is the most satisfactory way of preparing a bed for the sutured nerve, and is done with the idea of avoiding reformation of scar tissue. Other methods have been tried, but are less satisfactory. They include: making new trajectory in normal muscle or fat and investing with various protecting membranes such as sheaths of fascia, sheaths of fat, veins and arteries, autogeneous or formalized, bone tubes, magnesium tubes and rubber tubes. (Full discussion of this may be found in an article by the author in the February number of Surgery, Gynecology and Obstetrics.) After completing a new bed for the nerve the two stumps are picked up and a point is selected free from scar tissue, and a guy-rope suture is so introduced that proper orientation can be maintained throughout the operation. This orientation is important. All intraneural scar tissue must be resected, as both the failures and researches of the war have shown.

Dujarier has compared the appearance of scar with that of normal nerve. Scar has no fasiculi, glistens, is homegeneous, and has little or poor blood supply when compared to normal nerve. The nerve has fasiculi that on cross section appear as small circles of hyalin and bleed on section from minute blood-vessels. The bringing together of a nerve without twisting or altering its anatomical relationship is important. Stoffel has described a funicular arrangement or grouping of fibers persisting throughout the nerve. On cross section the area of each funiculus may represent the supply to some muscle or group of muscles. Grouped about the areas of motor fibers are funiculi of other nerves. Tinel also dwells at great length on funicular topography. These terms, funiculi and fasiculi, are used to express the same structure.

Borchardt says corresponding nerve tracts should be brought into apposition. On the other hand, Heile and Hezel minimize the importance of such orientation, using for an argument, that haphazard suture before such orientation was understood brought good results. Downgrowth of neuraxes, as seen in Perroncito's plates showing regeneration, do not occur in regular columns but often cross ina most irregular manner. Schwann thought it improbable that corresponding fibers as before division unite. Rawa states that nerve centers can innervate organs which do not belong to them as soon as united by nerve conductors. Langley and Anderson, Kennedy, and Flourens found that one nerve could be cut and sutured to another with resumption of function.

Great care must be exercised in exploring scar, for oftentimes intact funiculi will be found. It is always best to save all these. In order to do this, the damaged funiculi must be dissected free and sutured. This must be done with the aid of the electric stimulator. For this purpose I have found the best instrument was an induction coil and two pieces of ordinary insulated wire. The wire was boiled and never got out of order. All complex electrodes do get out of adjustment. When the damaged funiculi have been stutured, the intact funiculi will bulge like the handle of a suitcase, but their neurilemma protect them if the dissection has been carefully done. When it is clear that there is complete anatomical interruption the scar should be removed in the following manner. The ends of the nerve, i. e., the sear ends, are grasped by artery forceps and the trunk put on tension. Then with sharp cataract knife, repeated section is done until normal cross section of nerve has been demonstrated. When the scar has been resected, all intraneural hemorrhage must be controlled. This is best done by applying pledgets of cotton wet in normal salt solution at 120 degrees. It may be necessary to clamp and tie some of the small vessels that occur inside of the nerve. The use of adrenalin or any other chemical agent is contraindicated. The tourniquet should never be used. When it is possible to bring the two scar-free ends of the nerve incontact, immediate suture should be done. Complete liberation of the nerve, transplantion to shorten the trajectory, and flexing the limb, will overcome considerable gaps. I have by this means bridged seven and a half centimetres gap in the sciatic and equal amounts in the ulnar. In these procedures all branches must be preserved. For instance, in bringing the ulnar over the condyles for the purpose of shortening the trajectory of that nerve, we find our mobilization is interfered with by three branches that supply the flexor profundus. These can be lengthened by splitting up the funiculi from which the branches spring for two or more inches. I have done this for a space of five inches without interfering at all with the function of any part of the nerve. When a nerve has been so prepared, if possible the ends are approximated by the guy-rope suture and this is tied. Then very fine sutures are placed in the sheath of the nerve so as to secure perfect approximation of that structure. This is important, for any hole left will allow the neuraxes to escape to become adherent to surrounding structures and to ultimately cause pain. From three to seven such interrupted sutures must be used. I have used very fine silk or 1,500 French linen. In no case have I seen any scar tissue result from these sutures. A little liquid vaseline is placed about the suture, and this is the only investing membrane used. All others, I am satisfied, are useless or actually cause trouble. This opinion is based upon exploration of wounds and such procedures as have been practiced in animal experiments. When the gap can not be bridged by immediate contact of the ends, then there is always one possible way of overcoming the defect,—that is, by the insertion of nerve grafts. Fascial tubes, veins, catgut, and all other devices are uncertain. Autogeneous grafts usually succeed if properly done. In this practice I have had success by using multiple strands of small sensory nerve.

Philipeaux and Vulpian, in 1869, succeeded in transplanting a piece of lingual nerve into the hypoglossal in a dog. Albert, in 1876, transplanted a human nerve from an amputation to a patient. Gluck subsequently revived clinical interest in nerve transplantation.

Several kind of nerve grafts have been made. They comprise: (a) pedicled autografts, suture par glissement (Sicard and Dambrin); (b) free grafts, autografts, homografts, heterografts.

Pedicled transplants are too difficult to come into common use.

With free transplants most investigators have expressed a preference for autografts as against homografts or heterografts. Kilvington places success with autografts at one hundred per cent, with homografts at fifty per cent., and with heterografts at thirty-seven per cent. Forssman ranks autografts first; homografts second; and heterografts third. Forssman compares the use of heterografts to that of bundles of catgut as being equal. Sherren records sixty per cent success with homografts, and forty per cent with heterografts in his

series of collected cases. Experimental figures with one hundred per cent of success in the use of autografts can not be taken as final, so far as clinical work is concerned. Large nerve-trunks for autotransplants are not available in clinical work. To obviate this difficulty, Dean, in 1896, used the radial nerve to supply a defect in the musculospiral. Everyone must admit there is a great discrepancy in size and in the number of axis cylinders between the radial nerve and the musculospiral. To obivate this in some measure, several strands of small sensory nerves have been used. Literature is not very replete with cases reports. Ingebrigtsen reports one failure where he had used a single strand. Dujarier and Francois report several failures. Gibson has reported a case with improvement limited to one muscle. Dejerine and Mouson indorse this method highly but do not cite cases to substantiate the claim. Ingebrigtsen quotes five cases operated upon by Foerster as being followed by improvement.

Homotranplants exhibit wallerian degeneration. Merzbacher considers wallerian degeneration a vital process closely related to regeneration. Therefore, if heterografts do not undergo wallerian degeneration, as claimed by Ingebrigtsen, there is a reason for the preference in favor of autografts and homografts. A series of twenty cases where homotransplants secured from amputated limbs and stored at 0° Centigrade in vaseline had been done, is reported by Dujarier.

These cases have not been operated upon sufficiently long to give definite results. The homograft has the advantage over the autograft in that large-sized trunks may be obtained. However, Maccabruni found that large nerve grafts become necrotic in the center, whether homograft or heterograft. In portions of heterografts well nourished, he found a slightly modified wallerian degeneration. Ingebrigtsen's collected cases give one autograft with one hundred per cent success; three homografts with thirty-three per cent success; and ten heterografts with ten per cent success. The available records of clinical cases are of slight value on account of the short time between the report of the case and the operation. Sherren's collected records of heterotransplants comprise 22 cases, of which 16 were sufficiently late to be of value. Of these, one made a complete recovery and six improved.

The experiments with various grafts done on animals up to the time of Huber were unsatisfactory. There is no conclusive evidence in experiments performed by Gluck, Johnson, Assaky, Bunger, Notthaft, or Willard. Huber performed ten heterografts that survived for one hundred and twenty days or more. These filled defects of six to eight centimeters in length and usually were transplants of eat sciatic into the ulnar of a dog. Of these, five showed regeneration of motor nerves to all muscles, and four showed regeneration of nerves to the muscles of the forearm. These conclusions were reached from making stimulation of the nerve and obtaining muscle twitches, and from histological examination.

Ingebrigtsen made a study of heterotransplant. He concluded that heterografts did not under go wallerian degeneration, but that they became necrotic; therefore, that regeneration could not occur through them. The preponderance of evidence shows that autografts are most susceptible to regeneration, but that some regeneration may occur in a heterograft.

"Nerve crossing" differs from anastomosis in that the entire thickness of both normal and degenerated nerve is cut through and the ends sutured. This was done by Flourens in 1828. Ballance in 1895 made application of this in suturing the facial to the hypoglossal. The greater number of clinical cases of nerve crossing have been done in connection with the seventh nerve. Sherren collected 40 cases of suture of the facial nerve. Of these, 8 were nerve crossing, 6 with the hypoglossal and 2 with the spinal accessory. Voluntary motion occurred in all. There were 32 cases of anastomosis, 20 with the spinal accessory, and 12 with the hypoglossal. While motor improvement occurred in all, the best results so far as disociation movements were concerned occurred in the hypoglossal series.

Kennedy crossed the medial and ulnar to the musculospiral, and secured full restoration of function. By stimulation experiments with the brain he found indications of interchange of cerebral function. Kennedy crossed the spinal

accessory to the facial in a clinical case in 1899. Langley and Anderson crossed the phrenic to the cervical sympathetic; the cervical sympathetic and the recurrent laryngeal; the cervical sympathetic and phrenic. Stimulation of the sutured nerve gave responses corresponding to peripheral distribution. Kilvington divided the sciatic and sutured the peripheral ends of the internal popliteal to the internal and external popliteal. Regeneration was considered complete, but this was not proven by histological examination. Rawa crossed the posterior tibial and peroneal, and stated that nerve centers can innervate organs which do not belong to them as soon as united by nerve conductors.

Other methods have been used to bridge defects in nerves. Various substances have been employed with the purpose of producing either a potential or an actual avenue for downgrowth of axis cylinders. Various absorable materials have been used in the form of a solid cylinder. Other substances less absorable have been used as a tube. This is the so-called "tubular suture". Huber employed bundles of catgut made up of eight No. 3 chromicized threads bound together with fine catgut. With these some regeneration is possible. This proeedure differs from Assaky's suture a distanee. In the latter a single strain of suture material was supposed to furnish a trellis upon which the nerve might grow. Bone tubes, designated as Van Lair tubes, consisting of decalcified bone, have been used and offer as much success as bundles of catgut. Payr advocated the use of magnesium tubes with the idea of keeping an open channel for downgrowth of axis cylinders. Formalized calf arteries were prepared by Foramitti and used in a few animal experiments. These tubes of Foramitti were employed clinically by Hashimoto and Tokuika in the Japanese-Russian war. Their use was in connection with neurolyses, and does not clearly establish the value of this procedure.

Fascial tubes have been employed by Kirk and Lewis. Nerves will grow down these tubes in dogs with re-establishment of anatomical function. The few cases reported in literature done by this method have not given definite results, especially when operated upon in the presence of scar tissue. Starr stated that he had seen several failures from this operation. The author of this paper has no knowledge of any sueeessful case, but has seen several bad results. Kredel also suggested the use of fascial tubes in 1915.

After suture postural treatment must be employed. The post-operative treatment not only must relax paralyzed muscles but must maintain the position by means of which the nerve ends were approximated at the time of operation. This is best accomplished by large plaster casts designed to aecomplish the purpose. In the nerve sutures these casts were kept on for six weeks, when the limb was gradually straightened.

In all but two cases where suture had been done, signs of improvement and promise of ultimate recovery occurred. One neurolysis failed because of inability to recognize intraneural scar tissue. One graft failed probably because the surral nerve used contained no actual nerve substanee. Grafting of the external cutaneous showed return of function. In the case where seven and half centimeters had been reseeted, return of function occurred in five months. One ulnar suture gave poor functional results because of the unwarranted over-stretching of muscles, that could not be overcome by subsequent treatment.

DISCUSSION

DR. A. W. MORRISON, Minneapolis: One of the points that impressed me especially in examining a large number of nerve injuries abroad was the difficulty in determining the severity of the nerve lesion on one examination, and, in fact, it is never possible to differentiate between a complete physiological and a complete anatomical severance except by exposing the nerve. I remember one case, in particular, in which the patient had been wounded in the popliteal space. When examined soon after the injury the typical motor and sensory signs of an external popliteal nerve lesion were present, so that as far as one could tell from the appearance of the wound and from his physical findings the nerve had been severed. On a second examination a few days later, I was surprised to find complete motor recovery, and the area of anesthesia had greatly shrunk and eventually cleared up entirely. Fortunately, I saw this case early in my experience in connection with nerve wounds, and it impressed upon me the difficulty of making an accurate early diagnosis as to the severity of the injury. In talking with other neurologists abroad I found this had been the common experience.

A great deal has been written and said about the

value of Tinel's sign. I think it should be tested for, but not too great stress laid on its importance. As Dr. Hamilton has stated, it signifies only that one or more of the axis cylinders are regenerating. The electrical reactions of the paralyzed nerves and paralyzed muscles are, in my opinion, important, but too much stress should not be placed on any one finding alone.

Incidentally, in this connection it is worthy of note that the slow, worm-like contraction of a muscle to the galvanic current is more significant of the reaction of degeneration than is the reversal of the poles.

The most important signs of severe nerve injury are complete and immediate paralysis of all muscles supplied by that nerve, with intense and rapid atrophy of the muscles associated with marked loss of muscle tone. Accompanying this there will be a gradual change in the electrical reactions and, eventually, a complete reaction of degeneration.

As Dr. Corbett stated, over 60 per cent of injured nerves regenerate spontaneously. There is no question but that the earlier an operation is performed the more satisfactory are the results, but a regenerating nerve is particularly susceptible to mechanical injury, and an early exploratory operation without sufficient indication is to be condemned, as it is likely to injure either the nerve or some of its fibers, or its blood supply. We should not operate on a nerve until we have examined it repeatedly and until we have had the case under observation over a rather prolonged time. A patient's statement as to improvement cannot always be relied upon, for after massage and passive motion had been instituted a number of cases thought their nerve injury was improving; examination, however, showed that a lossening up of adhesions and improvement of the general tone of the muscles was all that had been accomplished.

DR. ARNOLD SCHWYZER, St. Paul: It was very interesting to me to see that some of the conclusions that Dr. Corbett came to, were exactly the conclusions that men on the other side of the trenches had come to, because in a Swiss medical journal I happened to read a short abstract of a German work on the same subject, and it is very surprising how they have come to the same identical conclusions. For instance: Dr. Corbett says that if three months after the healing of the wound there is no restroation of function we had better operate. These other authors say, if four months after the injury we have no signs of restoration of function, that is the best time to operate. We can give about a month for the healing of the wound, and then come to the same date.

The results that the doctor has had, are surprisingly good. The German authors in speaking of direct nerve suture, have had only 60 per cent of final cures. The doctor was not able, on account of the shortness of the time, to say how many complete recoveries he had. The German publications tell us that they had a return of function even two and a half years after operation. That means the patients had a long chance to get their 60 per cent of recoveries. Any one who has seen the delicate, exact and finished technic of Dr. Corbett realizes that this is essential. I would like to emphasize the point that we have no bleeding; that we have no twisting of the nerve; that we have no rough handling or stretching of the nerve tissue. All these things must be (in my estimation) the cause for difference in the percentage of results.

There is one question that would interest us in private work that the doctor did not have a chance to touch on, and that is: Is it very much better, if we have an injury, to unite the nerve right then and there, or if we have good reason to fear severe infection, might we just as well treat the whole wound in the most simple way, paying our particular attention to the infection. Can we promise our patients that after a month or longer that nerve suture will do any good?

Here the results of the Germans have been interesting. I read that they had practically just as good results after three and four and five months after the injury as they had with immediate nerve suture. I suppose that we have to figure that the loss of time was counterbalanced by operating in a cleaner field.

There were even some results reported in cases that were operated on a second time, one and a half and two years after nerve suture.

As to the question of bridging the nerve, when there is too much of a gap: We hear of fine results from bridging nerves, and direct union over a distance of a seven centimeter gap.

To take a nerve from the same person, a sensory nerve, is undoubtedly the best thing to do, and I see that Dr. Corbett did that practically exclusively. You get good results often, and good results are even reported when nerves were taken from cadavers, from amputated limbs, etc.

I would like to close my remarks by asking Dr. Corbett what kind of sensory nerves he prefers to use.

DR. ARTHUR F. BRATRUD, Minneapolis: I have listened to the papers of Drs. Corbett and Hamilton with a great deal of interest, as I have been connected with this work the past year.

In regard to the different lesions involved, I collected a series of 356 cases which I had observed and examined up to March, 1919. And in this series of cases, our ulnar injuries predominated over the musculospiral. Later in the year we received a large number of cases from other hospitals with injuries of the upper limbs, but as yet, however, our ulnar injuries prodominate.

In regard to the D. T. P. sign, we did not attach much importance to it, although with a number of injuries it does aid in localizing the nerve injury. Post-operative, we found it quite valuable in determining the point, to which regeneration had taken place.

Dr. Hamilton spoke about Hypertrichosis and its value in the diagnosis. This occurs in any limb or part of the body where there has been immobilization of the exeremity or protection of the part, or in an

extremity after the same period of rest. The number of cases that went on the spontaneous recovery, was quite high. Up to May 1st we estimated 75 per cent, but at the present time we estimate about 65 per cent to 75 per cent.

I think a good many of the compression injuries should be explored. We had one case of sciatic nerve injury where there was complete recovery in the middle third of the thigh (estimate 80 per cent) in eight months. Numerous cases have shown signs of return in five months. In case of dense neuroma, resection was performed rather than neurolysis.

Splinting is one of the most essential requirements in care of these cases, as Dr. Corbett has emphasized. The splint should be made *for the patient* himself. Anybody who has seen this work, will hold the same view. Improper splinting may be the cause of so marked contraction, especially in the metacarpo-phalangeal joint, as to render the return of function impossible. In one case of suture that I did at the same time a bone graft of the humerous was performed, a splint was applied for two weeks and at the end of this time there was so marked contraction of the metacarpo-phalangeal joint, that patient has not at the end of five months overcome this so-called preventable performity.

Another point emphasized by Dr. Corbett was the fact that the extraneural candition is not indicative of the pathology prescnt.

There is one thing we proved without doubt, and that is, regeneration will take place much quicker in early suture of nerves, also early resection of neuroma, when nearly complete physiological interruption exists. I have sutured two cases of ulnar nerve. upon which neurolysis had been performed, and no return of function in seven months. One of these cases have showed complete return of ulnar function within 90 days. This is the only case of ulnar nerve injury that I have seen return of complete intrinsic muscular action of the hand.

In regard to the technic, there are several points Dr. Corbett spoke about and emphasized, and among them a clean cut dissection and preservation of all branches. With reference to transplant of fascia. Two cases which I have had fat and fascial grafts, which I re-operated showed the fat fasua to be in a very good condition at the end of seven months. A nerve is similar to a telegraph wire. It is irritating to the tissues if without pastiction. A nerve sheath acts as a protection to the nerve similar to a nonconductor.

In overcoming gaps, I use practically the same technic as Dr. Corbett did, viz different positions of the limb, nerve transplants from the leg or forearm and Homo transplants. These latter, taken from amputation cases and preserved in liquid petrolatum on ice. As yet we cannot state the result, but at the present time it is very encouraging.

DR. E. K. GREEN, Minneapolis: I would like to report one case and ask a question of Dr. Corbett as to what is the best procedure, in his judgment, in the matter of determining when to operate.

In civil practice we do not have so many cases as they do in the army, but I had one case which interested me particularly. A railroad man, who was rolled between a car and bridge girder and received a fracture of the humerus had a very positive and definite musculospiral paralysis from the beginning. I think it was about three weeks afterwards we operated on this man to see if we could find out what was the trouble with the nerve. Ordinarily, I think, many of these cases recover without doing anything. In this particular case, however, the proximal end of the humerus had a split in it and the nerve was about three-quarters or four-fifths cut off and pulled into the little splint in the bone, and we had considerable difficulty in releasing it from the bone. With bone forceps we were able to trim off the bone until the nerve released itself and came out. A strip of nerve was intact and we carefully sutured the rest of the nerve end to end. This was before the time of the war, and we were very much disappointed that the man did not show a quick recovery from the musculospiral nerve injury. He left the hospital in two and a half months with almost no use of the musculospiral, and this was before I learned about the cockup splint, and we put him on a straight splint. I did not see him again until about a month ago which was about a year and a half from the time of the injury, when he returned with as perfect motion in the injured hand as in the other one. He was driving a truck and was using both arms with equal dexterity.

The question arises, are we justified in going into these fractures of the humerus for the sake of determining how much injury there is to the nerve? This was not a compound fracture.

DR. E. H. MARCUM, Bemidji: Dr. Corbett asked about front line treatment of these injuries. My experience in this work is limited to the Argonne Forest Drive, and I think there is one thing that impressed itself very firmly regarding the treatment there, and that is this: These nerves should be sutured as soon after the injury as possible. I don't mean to go into the exact suturing that Dr. Corbett speaks of, but, at least, we should strive to get some kind of apposition, so that the neurologist later can find these nerves without having to destroy the anatomical relations of the whole arm in hunting for them. Also, there should be I believe burying of these nerves in muscle tissue as much as possible, because 100 per cent of the wounds were at least potentially infected, if not certainly so, and the amount of pus which runs over the nerves will increase the scar tissue and scleratic condition of the nerves to a certain extent.

Another thing of great importance at that time is your splinting. These three points are the main things to be taken up in the early primary treatment to help out the later results, not that you get any particular action from healing nerves, but just to help out in future work.

DR. CORBETT (closing the discussion): Some of the questions have been asked throw a great deal of light on the subject, particularly this work by Dr. Schwyzer, of St. Paul, on early and late suture.

In going over the history of the past it seems to me, the sentiment is in favor of early suture of the nerve, and the results accomplished by immediate suture of a clean cut nerve were always better than when the suture was done late. But I believe there was a reason for that. When we have a nerve that is recently cut there is no intraneural scar tissue and we do not have to overcome that obstacle. The history of early nerve suture shows that most surgeons neglected the question of intraneural scar tissue. Therefore, the results would be better when the nerve was sutured before there was any opportunity of scar tissue developing in the nerve, but with the proper resection of scar tissue from the inside of a nerve the results of late suture and immediate suture seem to be much the same. However, there is a distinct advantage in the early suture of the nerve. If we leave a cut nerve alone we know that it is going to retract and if the individual is not splinted we know that movement will still further separate the ends, so that it saves an immense amount of dissection for the future and an immense amount of work to get the ends together at once, and if that suture is a failure the nerve is easily found and can be freshened and reunited with very little trouble. So I think the argument is in favor of early suture of nerves in clean wounds.

As to infected wounds, what is the argument there? When a nerve is cut and the wound is infected, not having had experience at the front, I cannot answer from personal observation, but I have talked with those who have had this experience, and particularly with Dr. Carrel, and he told me that important nerves ought to be sutured for two reasons. In the first place, they resisted infection more, and I have seen that. I have seen a large suppurating wound with a nerve crossing through it, in the great suppurating mass the nerve being the only intact structure that was left, with the nerve completely surrounded by pus, and still function of the nerve was apparent. So I really believe with Carrel that these nerves should be sutured. Furthermore, he recommended the use of Carrel-Dakin solution.

As to the kind of sensory nerves for grafts, we want to use a nerve that will give as little trouble as possible. The use of the intercostal nerve has been advocated, but the dissection of that nerve is a difficult job. Keen has advocated the use of the radial nerve, and we know oftentimes when we take out the sensory radial, there is no loss of sensation whatever from doing it. I have repeatedly used the musculo-cutaneous nerve, and of course, when you use that in the foot there is the loss of sensation over the outside of the foot, and it is a question whether we ought to do it. The crural nerve works sometimes, but sometimes it does not. Dr. Schwyzer suggested the ilioinguinal nerve.

Dr. Dyke said how do we know that a motor nerve wont grow down the sensory tract, and what happens if it does? Many experiments have been done to bring together motor and sensory nerves, but for some known chemical or physiological reason we know that a motor nerve will select a motor tract and a sensory nerve will select a sensory tract. There has been a lot of research work done on that during the present war, and an attempt has been made to explain it by using the word neurotrophism, a term coined by Murphy. Just why these nerves try to select their own tracts, I do not know.

ACUTE PERFORATIONS OF STOMACH AND DUODENUM*

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Among the sudden catastrophies which endanger human life must be included acute perforation of stomach and duodenal ulcers. This is fortunately not a frequent occurrence.

The seriousness of acute perforations and the necessity for their prompt recognition and treatment serve as an excuse for reviewing the literature and bringing the subject before this body for consideration.

Perforations are classed as acute, sub-acute and chronic. By acute is meant the sudden giving way of the ulcer base and the injection into the peritoneal cavity of stomach or duodenal contents.

Acute stomach perforations occur most often soon after eating and are near the pylorus in about 80 per cent of the cases. A large perforation allows much stomach contents to escape into the peritoneal cavity and the tendency to spontaneous closure and blocking is less than in the smaller kind. Free perforations in the posterior stomach wall empty into the lesser peritoneal cavity and may cause a subphrenic abscess or a general peritonitis by the flow of the infectious material through the foramen of Winslow. The liquid or semi-soft contents of the stomach soon after a meal is infectious and its injection into the free peritoneal cavity at this time quickly cause a peritonitis. The opportunity for closure of the opening by omentum or by adjacent organs is slight, and an extensive spread of infection is the result.

Perforations of the duodenum differ from the

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above in many respects. Its contents is liquid and nearly sterile and usually does not spread throughout the general peritoneal cavity, but is deflected by the colon along its ascending portion into the right inguinal fossa and pelvis. For this reason it is often diagnosed and treated as acute appendicitis.

There is a considerable tendency toward the self closure of duodenal perforations by the omentum or by the near organs, thus limiting the infection.

If the patient is not too prostrated, he may give a history of digestive trouble of long standing, or he may state that he has never had any previous trouble. The onset is always a sudden agonizing pain in the upper abdomen, with occasional vomiting, fear of death, and considerable shock.

On examination, the patient shows evidence of severe suffering with a varying amount of shock. There is an absence of abdominal breathing and palpation elicits a marked rigidity and tenderness of the abdomen which is characteristic of perforations. The greatest tenderness is in the upper abdomen and if some hours have passed since the onset of the symptoms, the absence of liver dulness may be noted, on account of the accumulation of gas; and there may be a dulness in the flanks due to the presence of free fluid in the abdomen. A leucocytosis is usually present. The diagnosis can ordinarily be made by the consideration of the above symptoms.

In the differential diagnosis, we must consider all causes of acute peritonitis. The first to be excluded is acute appendicitis, which has often been diagnosed when acute perforation was present. Other conditions to exclude are acute perforation of the gall bladder, rupture of an appendiceal or pelvic abscess, acute pancreatitis, ilius, and cysts with twisted pedicle.

After a diagnosis of perforation of some kind has been made, it is not well to waste valuable time by hair splitting discussions of the value of the finer diagnostic signs or to postpone the operation to a more convenient time for the surgeon, but to give the patient the benefit of the doubt and advise immediate operation.

Perforations of the stomach are more dangerous than those of the duodenum because of the more infectious character of its contents and the tendency toward its general dissemination throughout the abdomen.

The prognosis depends above all else on the time which elapses between the rupture and the operation. Every hour which passes adds to the danger. Dr. W. H. Mayo states that recovery nearly always takes place if the operation can be performed within ten or twelve hours. The mortality increases between ten and thirty hours. After 48 hours the percentage of recoveries increases. The amount of stomach and dodenal contents which has escaped into the peritoneal cavity and the degree of its infectiousness are important factors in the prognosis.

Undoubtedly a small percentage of patients with acute perforation recover temporarily under medical treatment or the let alone plan, but the number is small compared with that following prompt and efficient operation. As these patients are often in a stage of partial shock and suffering from peritonitis, it is important to use all available means to conserve the patient's strength and resistance. The use of local anesthesia combined with nitrous oxide or small amounts of ether, as well as gentle technique and rapid operating, are important factors in these cases. We have found that the transverse incision has been helpful in most of our upper abdominal cases.

Upon opening the peritoneum free gas and considerable fluid, containing stomach or duodenal contents and occasionally bile, are found. A rapid microscopic examination of the fluid will in case of doubt aid in determining its origin and also its relative infectiousness. If the fluid be tested with litmus paper, an acid reaction is in favor of a stomach perforation. In 1917, Dr. H. L. Baker advocated the giving of three grains of methyline blue in an ounce of water a short time before the operation. This will stain the point of perforation and assist in its prompt location, although light pressure on the stomach or duodenum will usually cause a little fluid to escape and thus enable the point to be quickly located. This opening should be closed with two layers of sutures if possible a tag of omentum should be sutured over it. This stops the leak. The suture should be placed so that it will not constrict or deform the stomach more than necessary. The abdomen should be gently and thoroughly cleansed with saline

sponges, paying especial attention to: (1) the upper abdomen; (2) the renal fossae and (3) to the pelvis.

The question of the necessity of gastro-enterostomy in these cases has been much discussed. Our leading authorities state that if the operation can be done within ten or twelve hours after perforation, gastro-enterostomy should be done. Much will depend upon the patient's condition, the amount of infection and the surgeon's experience as well as the team work in the operating room. If the patient's condition is bad or there is marked peritonitis, the conclusion seems to favor closure of the opening and putting off of the gastro-enterostomy until a later date.

In a perforation of a posterior gastric ulcer, the escaping stomach contents may enter the lesser abdominal cavity. These perforations are difficult to treat and sometimes it is impossible to reach the affected area form behind or through the gastro-colic or gastro-hepatic ligament, and a trans-gastric operation is needed.

In duodenal ulcer the perforation is usually within two inches of the pylorus, on the anterior or superior wall. Closure should be made as in the stomach and gastro-enterostomy performed if the patient's condition warrants. The destruction of the ulcer area by actual cautery, as advocated by Balfour, is an important step. The kind and amount of drainage will differ with each case and with each operator; undoubtedly damage is often done by too much drainage. Careful cleansing of the peritoneum followed by a split tube drain through a small wound over the pubis and small cigarett drains to the primary area of infection, will suffice in most cases. The necessity for drainage increases as the time lengthens between perforation and operation.

The after-care is similar to that of any peritonitis case. Fowler's position, saline hypodermoclysis and proctoclysis, careful stomach lavage for acute distention and abstinence from food for a limited length of time, are important post operative steps. The patient should be kept under careful observation and complications, such as bowel obstruction, secondary abscesses in the abdomen and subphrenic space and other intra abdominal complications, carefully searched for and promptly attended to, if present.

As a prophylactic measure, it may be suggested that all chronic ulcers of the stomach and duodenum be given proper treatment before the patient is subjected to the danger of an acute perforation.

Following is a brief report of our cases:

(1) F. P. Male, age 38, editor: He gives no history of previous digestive trouble, but 48 hours ago he was taken with a sudden severe pain in the epigastrium, followed by vomiting at intervals for 24 hours. The leucocyte count was 18,000.

Operation disclosed free gas and fluid in the abdomen with the intestines so distended that it was necessary to insert a trocar and drain off quantities of gas and fluid contents. On the anterior surface of the duodenum, two inches below the pylorus, was an indurated area in which was found a perforation. The opening was closed with two layers of suture and a posterior gastro-enterostomy performed. Drains were inserted to the abscess site and into the pelvis which was filled with purulent-like exudate.

He recovered without complications and later reported that he was getting on well.

(2) O. O. Female, age 31, wife. Gave a history of digestive trouble for many years. One week before entry into the hospital she was taken ill suddenly with severe upper abdominal pain, and has been very ill since. Her pulse was 120, temperature 100, leucocyte count 25,000.

A short transverse incision was made over the right upper abdomen. Free gas and a dark foul smelling fluid was found with an abscesslike cavity underneath the G. B. On account of the patient's poor condition, nothing further was done and light pack and drainage was introduced. Upon removal of this a few days later, it was found that liquid foods like milk appeared in the wound a few minutes after they were taken by mouth. Five days after the first operation another incision was made and a posterior gastro-enterostomy was done. A hole nearly an inch in diameter was found in the stomach just proximal to the pylorus, the large opening probably being partly due to digestive action. The stomach and pylorus were completely severed, infolded by suture, and free

drainage inserted. After a slow convalescence, she finally recovered and is getting along quite well.

(3) L. H. C. Male, age 24, farm laborer. Has never been ill. Gives no history of indigestion. Four days ago was taken with sudden severe pains in upper abdomen. He vomited frequently and the pain has been continuous since. The examination showed a distended, tender abdomen; white blood count 5,800, no blood in stomach washings. The operation disclosed free gas and sero-hemorrhagic fluid in the abdomen. Intestines markedly distended. Loops of small intestine and omentum were found adherent to the duodenum. On loosening these, a perforation just proximal to the plyorus on the anterior border of the stomach was found. The opening was sutured over and infolded and an anterior gastro-enterostomy performed. Drainage into upper abdomen and pelvis inserted. Convalescence was complicated by bowel obstruction which was relieved by establishment of a fecal fistula. Patient otherwise made a good recovery.

(4) S. K. Male, age 23, farmer. Gives history of stomach trouble for three years. He was given a bismuth meal and an x-ray examination which demonstrated a duodenal ulcer. The following night he was taken with severe upper abdominal pain which continually grew worse, and 13 hours after the onset of this pain he was operated. Free gas, mucus and bile-stained fluid were found in the abdomen. He had a small perforation on the anterior wall of the duodenum. This was sutured and a posterior gastro-enterostomy was made and drains were placed in pelvis and kidney pouches. Convalescence was complicated by a right lower lobe pneumonia and a left-sided phlebitis, and a small intestinal fistula which gradually closed. At last reports he was getting along well.

(5) G. S. Male, age 27 years, farmer. He gives a history of having had epigastric pains three weeks ago, and three days ago he has severe pains in the upper abdomen. He vomited frequently and was unable to expel flatus. Operation disclosed free gas and considerable purulent-like fluid in the abdomen. The small intestines were so distended that puncture was needed for the evacuation of gas and liquid contents. A perforated ulcer of the duodenum two inches below the pylorous was found. This was sutured as usual and a posterior gastro-enterostomy performed and a catheter placed into the lower ilium to lessen danger of bowel obstruction. Drains were inserted into the pelvis and kidney pouches. He made a slow recovery but at last report he was getting on well and had gained 40 pounds in weight.

(6) E. D. Age 31, male, hotel keeper. He had epigastric pains three weeks ago. Three days ago he had severe upper abdominal pains and vomiting and slight jaundice.

Operation disclosed gas and dark fluid in the abdomen, and a perforation in the stomach just proximal to the pylorus. The opening was closed and a posterior gastro-enterostomy performed. He made a good recovery but returned in about six weeks complaining of faintness and history of tarry stools. He was kept quiet a couple of weeks on careful diet and has since given us a good report.

(7) Girl of 18, well developed. She had never complained of any gastric disturbance. She had a sudden excruciating epigastric pain one evening after returning home from a party where she ate a light supper.

She was first seen in consultation two days after the onset of the illness. She was suffering intensely in spite of liberal use of morphia. The temperature was 102, pulse 130, respirations fast. The abdomen was distended and there was marked muscle spasm over the right side. Operation was performed at once in a farm house 40 miles in the country. The right abdomen was found to contain a well walled off cavity containing pus, fibrin and food remnants. A small perforation of the stomach just proximal to the pylorus was found through which was escaping small milk curds. The fluid was acid in reaction.

The perforation was closed with two layers of catgut, which was the only suture material at hand, and a loose pack inserted as drain.

The patient seemed to rally for a day, but death ensued the second day from absorption and general sepses rather than from general peritonitis.

DISCUSSION

DR. R. E. FARR, Minneapolis: Dr. Ramstad has covered in a very classical manner this important

subject which has so many angles that I hardly know where to begin.

Our experience with perforated gastric ulcer has been intermittent. We get them just often enough to keep us on the qui vive. My personal experience covers about 20 cases, and during the earlier years of my practice I would go along for perhaps a year or two without seeing a case.

In the diagnosis, the recognition of the condition is very important. In our first experience with a young girl we made a diagnosis of intestinal obstruction. The condition was diagnosed as soon as the abdomen was opened. I have made the diagnosis of perforated gastric ulcer in every case since that I have operated on. I have also made it in several cases that did not have it. I should have been more alert. In all these cases we have an acute surgical condition and operation is indicated. It is interesting to note that after forty-eight hours the safety of the operation begins to increase rather than decrease with time. In the subacute cases it is a grave question how one should handle these conditions.

I had a man die very suddenly from a terrific peritonitis who was getting along nicely for ten days. He had a perforation of a duodenal ulcer which we thought was fairly covered over, and after repeated consultations I was willing to operate at that time believing I could handle the case all right.

With regard to what we shall do, I have hesitated in most cases to do gastroenterostomy and have contented myself with a complete excision of the ulcer-bearing area. I believe the Balfour method is a good one and gets rid of the indurated mass. I have made a wide plastic covering up the area transversely. This can be done in the stomach and duodenum. I have had no cases in which I could not do this, although there are some in which there is a mass as large as the hand on all sides of the ulcer.

The question of drainage is one of the knotty points of this subject. How much shall we drain, when shall we drain, and where shall we drain? I think it is a common custom to put a drain in the pelvis and one down to the point of perforation. I cannot clearly understand whether drainage in these cases does any good or not. The more I see of drainage, the less I drain, particularly when we consider the work of Richter and other good men who are getting away from drainage in these early cases. I never saw an ulcer that had an opening in it half an inch in diameter that had an acute perforation. Later, when these patients die and you see the ulcer, you may put your thumb into it. A Christian Scientist had one of these perforating ulcers. In this case we opened the abdomen and found an opening in the ulcer in which one could put his thumb. In the early acute perforations they are pin point.

I had a Polish patient who was drinking and eating sausages and a lot of other stuff an hour or two before perforation occurred, and he had very little in his abdomen except his protective fluids.

In the last ten years we have operated on every one of these cases under local anesthesia, and I have been surprised at one thing, namely, the intense board-like rigidity of the abdominal wall, which is the most characteristic point in the diagnosis. It holds the tissues in the abdomen absolutely still. The last patient I had came in on his knees doubled up in the knee-chest position, holding the limbs absolutely rigid. After I had rolled him over and blocked his nerves in the abdominal wall he said he was perfectly comfortable.

In reference to the important question of where pain in the abdomen is produced, I will say that Mackenzie has covered this subject. He believes pain is felt in the thoracic nerves, and not in the abdominal cavity at all. In this case and in several other cases I have seen in which I blocked them with local anesthesia, cases that never went through the excitement of the first stage of general anesthesia and the perfect relaxation of the last stage and that, from the time the perforation took place, held themselves absolutely like a vise—what happened? They held the perforations without leakage in the vast majority of cases. They held them right there in the cases we did under local anesthesia as shown by elevating the abdominal wall, with negative intra-abdominal pressure allowing the stomach or duodenum to drop away from the parietal peritoneum, which was adherent. These little pin point openings do not leak at all, and I believe it is later on that these ulcers leak. A transverse incision, with negative abdominal pressure in these cases, and lifting up the abdominal wall will allow us to see the conditions sufficiently clearly.

One point which the doctor did not cover in the diagnosis I want to refer to, because I believe it is going to amount to something in the diagnosis, and that is a rotgenogram of the free gas in the peritoneal cavity.

DR. J. S. HOLBROOK, Mankato: It seems to me that the subject Dr. Ramstad has brought before us is one of the medical subjects that has turned to the surgical side more than any other. I am sorry the members in the back part of the hall did not hear all of the doctor's paper, because the most important thing he wanted to tell the general practitioner is that when a case occurs in which there is abdominal rigidity and possibly tenderness or vomiting, or some other symptoms, there is an acute surgical condition which ought to be taken care of, and one ought not to wait to make a hair-splitting diagnosis but get the patient into a hospital where he can be cared for.

He says 20 per cent of these ulcers perforate. That is a large proportion. Deaver thinks a little over 5 per cent perforate.

Surgeons have been urging for years that all cases of chronic ulcer of the stomach should be operated on early, just as cases of appendicitis and cancer should be operated on early. We know whenever a patient shows evidence of stomach trouble we should

send him to some one who can make a proper diagnosis and get an operation done before perforation occurs.

Dr. Ramstad has been very successful in his cases, but unfortunately his clinicians did not send the cases within the twelve hour limit. He had one case that came near that limit, and that was in his own practice. He lost but one of the seven or eight patients, but because he did not lose more of them is no reason why we should not operate within the first twelve hours, when possible as this is the safest time.

DR HUGH WILLSON, Minneapolis: I have had a rather peculiar experience with ulcers of the stomach for the last six or seven years. My work has been confined entirely to gastro enterology and practically all ambulatory cases. During these six or seven years we have handled probably in the neighborhood of 300 ulcer cases and of that number, I do not know of any that have had an acute perforation. All cases gave a long history; they were of the type that nature had protected, and in a considerable number of them the ulcer had penetrated, showing an accessory pocket to the stomach. Some of these chronic perforations have been into the liver or pancreas, but of those cases with a long standing history that have come in from a distance, all ambulatory, I do not know of any in which acute perforation of the ulcer had occurred. My impression is that the perforating cases are of a different type. From what I have seen of them and have read of them, they seem to be largely without history. The cases I know of have perforated without previous history, or with a very slight previous history.

My attention has been called to this two or three times by insurance men who have asked me questions on the subject. Recently an acquaintance approached me on the subject and wanted to know how such a thing could happen. He told me he had recently written a $50,000 policy for a man who three weeks later died of a perforated ulcer of the stomach without any previous ulcer history.

The point that strikes me particularly is that the cases of acute perforation belong to a different group from ulcer cases as seen by the gastroenterologist who is dealing with the ambulatory types, where the more or less indolence of the condition gives time to protect by organized exudate and adhesions.

DR. A. F. BRATRUD, Minneapolis: I should like to report six cases of acute perforation of the stomach which were treated a little differently from what Dr. Ramstad treated his cases, with one death. These cases were all treated similarly to those of Dr. Farr with local anesthesia plus ether, or gas and ether. The perforation was located and closed in a matter similar to that described by Dr. Ramstad. A typical jejunostomy was performed in four out of six cases, with recovery in all cases. The jejunostomy tube was covered over the serosa for about an inch and a half and then omentum was covered over the jejunostomy opening. These cases were all given fluid on the table before they left the operating room. I think one very important thing in all these cases is that they are dehydrated and fluids are of great importance. In the one case that died the perforation was of four days duration. That brings up the question whether it is advisable to operate in these cases after a certain period.

We have not been fortunate in obtaining roentgenograms of these cases afterward. Only one case had any trouble to speak of after the jejunostomy, and that patient we fed through the jejunostomy opening thirty days. This man had trouble in taking his food for about three weeks after he began to take food one month after operation. All of the cases are symptomatically free and practically cured so far as the condition is concerned. All cases were practically free from any disension and did not suffer at all from gas pains.

DR. C. P. NELSON, Minneapolis: Acute perforation of a stomach or duodenal ulcer usually calls for an emergency operation, and it is often impossible to secure the services of an experienced surgeon. Because of delay in coming to operation these cases are often not in a condition to stand very much. Prompt action and gentleness is essential. A liberal exposure is necessary. Anterior perforations are readily accessible. If on the superior surface of the duodenum, that can be rotated anteriorly. Armed with a curved round needle, and No. 1 chronic catgut, it is possible to close the perforation quickly with a continuous through and through suture, placed transversely. The suture must not be pulled tight or it will cut through the friable tissues. Then one or two stay sutures placed at a distance where the tissues are in better condition, will assure a position. This should next be covered with a liberal portion of omentum, held in place by a few stitches. If we stop to do much we are apt to loose our patient.

I had a gratifying experience in a case of duodenal perforation of about forty-eight hours standing. The hole was half an inch in diameter. General condition of patient was desperate. Dealing with the situation in the way I have just described, he made a good recovery and has remained well, now nearly a year. No gastro-enterostomy was done, and does not seem to have been necessary. If done at the time, patient would surely have died. There is usually not much drainage in these cases. In the one just mentioned, though there was a large quantity of muco-purulent material in the pelvis, necessitating a supra-pubic drain, there was practically no drainage after the first twenty-four hours.

DR. RAMSTAD (closing the discussion): I was very much interested in what Dr. Bratrud said in reference to performing jejunostomy in these cases. I have no doubt that is a very valuable procedure, especially where peritonitis is somewhat advanced, and it occurs to me and to others with whom I talked last evening that it would be an important procedure in many surgical cases.

In regard to the history, it is undoubtedly true that these patients are suffering so when you first see them, that it is difficult to get a clear history, but we have tried hard to get a history in a few cases, and many of them claimed they had never had any trouble at any time until the acute perforation occurred.

Relative to the use of local anesthesia. I will say that those of you who have not tried it and do not care to work entirely under local anesthesia, will be surprised to see how much better you can begin with the general anesthetic after the abdominal wall has been infiltrated with local anesthesia. It will lessen the amount of ether or nitrous oxid, and the anesthetist will be able to get along with less ether, and the patient will take the anesthetic much better afterwards.

In regard to drainage, I agree with the gentlemen who have discussed this phase of the subject. I believe if we learn our technic better, if we become more and more accustomed to handling these acute cases, we will use less drainage, but we will also be more careful about cleansing the abdomen after operation. We should sponge off carefully, look into all corners, and do as good a job as we can, and be very charry in the use of drains. I suppose we all feel when we see half a dozen drains in the abdomen that the patient has a small chance for recovery. My personal conviction is that fewer drains should be used, but they should be well chosen, well placed, and the abdomen should be thoroughly cleansed before they are inserted.

THE TREATMENT OF FIFTY-ONE SELECTED CASES OF INFLUENZA IN THE EPIDEMIC OF 1920

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During the influenza epidemic occurring in January and February, 1920, fifty-one patients with influenza were admitted to the Stanley Hospital, Rochester, Minnesota. The severity of the disease in these cases was much greater than would be found in the average town or community, since it was impossible to care for all patients in the hospitals. An effort was made, therefore, to admit only those especially in need of hospital attention. A definite diagnosis had been made in all the cases; the complications were only those that accompany influenza.

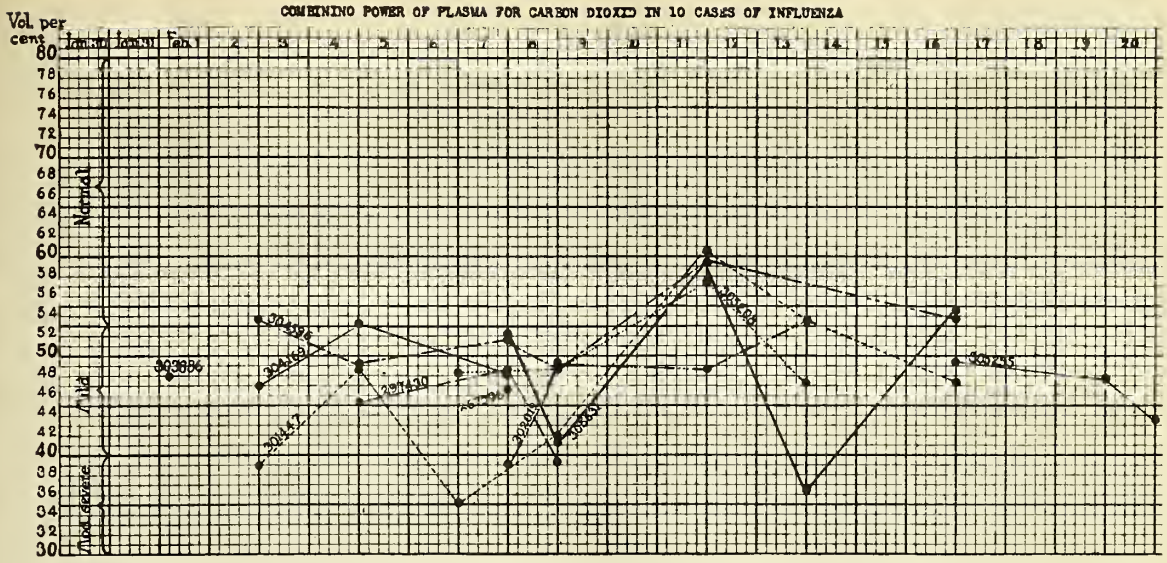
The severity of the disease in the first patients that came to the hospital resembled the severity in those who had influenza in the latter part of the epidemic of 1918. Patients had the symptoms of prostration characteristic of that seen one year before; namely, a chilly and feverish feeling, general muscular aching, malaise, anorexia, and sometimes nausea, headache, and pain in the eyes, in all respects the picture of a person acutely ill.

The records in the histories of these patients showed that a sudden onset had occurred with chill in 46 per cent; a slower onset, usually expressed by a severe cold in the head, followed by weakness and a chilly and feverish feeling in 40 per cent; the onset had been uncertain in 14 per cent.

The physical findings in the early cases were strikingly few. The patients were usually admitted on the second or third day of illness. At this time they were restless, their faces were flushed and usually they had a slight dry cough. The oropharynx, as a rule, was acutely inflamed, but the lungs were apparently normal. In the early stages of the disease there was a noticeable discrepancy between the high fever with severe constitutional symptoms and the absence of any gross local lesion.

Thirty-one of the fifty-one patients had influenza only; their average leukocyte count was 10,000, and the average maximum temperature 102°. Only one of the patients of this group had blood-tinged sputum. There were no deaths. Twelve patients had bronchopneumonia with influenza; their average leukocyte count was 14,000, and average maximum temperature 103.2°. Of this group four patients had blood-tinged sputum and three died. Eight patients had bronchopneumonia and empyema complicating influenza; their average leukocyte count was 31,000, and average maximum temperature 104.1°; two of these patients had blood-tinged sputum and six died, making a total of nine deaths in the fifty-one cases.

The importance of absolute rest and quiet is frequently not given proper consideration in the treatment of influenza. The patient should be put to bed as soon as a diagnosis of influenza is made. Very often the patient will object to this; he is not feeling very ill, and will request to be allowed to use the bath-room. All such privileges should be denied since many



patients are made worse by this unnecessary exposure. Certainly a big step has been taken in the treatment of influenza when the patient is in bed, is feeling fairly comfortable, and is away from all disturbing influences.

Recent literature on influenza contains many interesting articles on the importance of isolation of the patient. Sajous says: "Chauffard, Netter, Vincent and others have called attention to the contagiousness of the complications of influenza. For example, some of the hospital wards would show septicemia, others intestinal localization, and so forth. It is advisable, therefore, to separate complicated cases from those without complications."

Most of the patients in our series occupied single rooms, but as the demands became more pressing two beds were put in the larger rooms. The marked similarity in the temperature charts, physical findings, and general condition of the patients who were in the same room, was observed in a sufficient number of instances to demonstrate the importance of isolation, especially of patients with complications. Plenty of fresh air was supplied and a uniform temperature of about 60° F. was maintained.

After patients had been made as comfortable as possible measures were instituted to combat the toxicity, and to control complications at the earliest possible moment. Maximum elimination means minimum toxicity, but too much enthusiasm in the administration of purgatives often exhausts the patient, and is, therefore, not justifiable. A saline laxative, as a rule citrate of magnesia, was used in our cases.

Large quantities of liquids were given to the patients; the diet was limited almost entirely to liquid foods and during waking hours they were urged to take a glass of water once every hour. If the mouth is kept clean and the water is flavored with a little lemon juice the patient will not object to the amount.

Patients were sponged while perspiring profusely to encourage skin elimination; great care was exercised not to have the temperature of the water at variance with the body temperature, not to expose the patient unnecessarily, and not to move him enough to disturb him. The sponging was occasionally followed by a light massage with dilute alcohol. Sponging was not done to reduce temperature, nor was it done so frequently as to exhaust the patient.

In the first day or two of the illness it was necessary to prescribe for muscular aching; the complaint was successfully relieved by giving about 15 gr. of phenacetin each day for one or two days. If the patient is without pain he is fairly comfortable and will get a maximum amount of rest, but restlessness seems to be a typical phase of influenza, and at times overshadows all other symptoms. Morphin hypodermically and codein by mouth were prescribed, but were used sparingly and only when necessary; no untoward effect could be seen to follow their use. This observation may be at variance with that of Bastedo who says

that morphin should be avoided on account of its tendency to produce edema of the lungs and tympanites.

Some of the patients exhibited gastro-intestinal disturbances, principally nausea and vomiting, and on the assumption that this was the expression of acidosis 3 gm. sodium bicarbonate were given at two-hour intervals until the urine became alkaline. Occasionally, also, a 5 per cent solution of sodium bicarbonate was given by bowel, using the Murphy drip method. In every instance the nausea and vomiting cleared up promptly.

Recent literature contains much comment on acidosis in influenza. Sajous says: "Acidosis is a recognized accompaniment of severe infection. . . . Considerable evidence is available to show that alkalinization of the body fluids definitely assists the organism in its defense against pyogenic germs." In contradistinction to this in Herrmann's series the blood chemistry was observed in twenty cases with the finding that: "There was a marked variation in the alkaline reserve. The fatal cases in the series studied, for the most part, showed a high alkaline reserve, at times approaching alkalosis, others showed a lower reserve. The variation was from 50.19 c.c. the highest, to 37.2 c.c. the lowest. Nine cases showed figures above 45 c.c. and four cases showed figures below 40 c.c. The explanation of the cyanosis on a basis of acidosis was found untenable."

In our series of fifty-one cases thirty-seven determinations of the combing power of the blood plasma for carbon dioxid were estimated in ten cases over varying lengths of time. The Van Slyke method was used. The results are shown in Chart 1. By far the greater number of readings, twenty of the thirty-seven estimations, are between 53 and 40 volume per cent, findings that are, according to Hawk, the limits of a mild acidosis. Five estimations revealed a moderately severe acidosis; the remaining twelve were normal. Of the ten cases studied only five determinations were below 40.

Rosenow's antigen was given, 1 c.c. daily on three consecutive days in all except the mildest cases. This antigen consists of a suspension of approximately twenty billion partially autolyzed pneumococci for each cubic centimeter of solution. Its action in cases of lobar pneumonia has repeatedly been so favorable that it was tried in cases of influenzal pneumonia with the idea of overcoming any pathologic disturbances which may have been caused by the pneumococcus organism.

The small number of patients in this series does not warrant definite conclusions with regard to the value of antigen in the treatment. We observed, however, that it had no ill effect on the patient's general condition. A decrease in temperature was noted in eleven cases immediately after its administration. There was general improvement in the patient's condition in ten cases and no change in eighteen. In the uncomplicated cases in which antigen was used there was an average leukocytosis of 11,000, the average was 9,000 in the cases in which the antigen was not used. The improvement noticed in many cases after the use of the antigen seemed to justify its continuance as a helpful therapeutic measure.

The rule of recovery was by rapid lysis. If the temperature remained normal for about one day the diet was increased, and on the second day a tonic, usually iron, quinin and strychnin, was given. The prostration following influenza so often observed in 1918 was not apparent in most of these patients. On the contrary many of them were anxious to get out of bed before it was even advisable for them to sit up. Sajous states: "Oftentimes an influenza patient after being afebrile some days would experience marked relief from discomfort and even feel well enough to rise from his bed and go out, a rise in temperature would then occur and signs of pneumonia would be discovered." The length of time a patient should be kept in bed after the temperature has become normal should be determined in the individual case. The lungs should be clear and the leukocyte count approximating normal. As a rule the number of days from the time of onset usually marked by a chill to the day the temperature finally remains normal, may be a guide, estimating about one half of this number of days as a suitable length of time to keep the patient in bed after the temperature has begun to follow the normal line.

SUMMARY

A study of fifty-one cases of influenza, occurring in January and February, 1920, shows

that the general severity was not so great as in the epidemic of 1918.

The most important essentials in the treatment of influenza are rest and isolation in the complicated cases, fresh air, and the maintenance of a uniform temperature of 60° F. When indicated, maximum elimination is encouraged by saline laxatives, liquid diet, large quantities of water, and tepid sponge baths whenever perspiration is profuse.

Small doses of phenacetin may be given for muscular pains, and small doses of morphin control restlessness when other drugs fail.

Gastro-intestinal disturbances may be relieved by sodium bicarbonate in 3 gm. doses until the urine becomes alkaline. In this connection it is interesting to note that the estimation of alkali reserve in the blood rarely indicated more than a mild acidosis.

Rosenow's pneumococcic antigen seemed to be a helpful therapeutic measure.

Recovery was by rapid lysis. After the temperature returned to normal the patient was kept in bed for a period equal to one-half of the number of days he had had fever.

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PARALYSIS OF THE ABDUCENS NERVE SECONDARY TO MASTOIDITIS*

By George C. Dittman, M. D.
St. Paul, Minn.

Paralysis abducens as a coexisting complication with suppurative otitis media with or without mastoiditis was first fully described by Gradenigo. While this associated condition had been reported prior to its final grouping in literature, it had not been recognized as a specific element in the syndrome.

*Read before the Minnesota State Medical Meeting, October 1, 2 and 3, 1919, Minneapolis, Minn.

It is primarily the domain of ophthalmology. When occurring as an alarming complication in the course of mastoiditis, the ophthalmologist would be the first consulted, though hope for recovery remains entirely with the otologist.

While syphilis holds the undisputed position as the etiological factor in an isolated paralysis, the subject under consideration is an enlightening example of what the present era of medicine expounds in that great category known as focal infection. For medicine as practiced today demands that the subject be studied from all positions, the local manifestations as well as the underlying constitutional conditions in an endeavor to ascertain the location of the focal infection. With medical progress advancing we are finding more and more that the eye becomes the great interpreter of an existing hidden nidus.

The literature does not abound with isolated case reports on the subject, nor do text books on otology or ophthalmology specifically emphase this complication; Roemer states "The abducens is the most frequently affected of all the nerves of the ocular muscles; it runs over the apex of the petrous portion of the temporal bone and may readily be involved in a circumscribed meningitis," and further on it is remarked "Paresis of the ocular muscles are very rare." Fuchs remarked, "In intracranial paralysis the focus of the disease lies within the cranial cavity." Politzer states, "Paralysis of the abducens nerve seldom occurs in diffuse leptomeningitis purulenta; in meningitis of the posterior cranial fossa, paralysis of the sixth nerve is especially pronounced."

As the complication has certain measured characteristics which warrants it being considered separately and not confusing it with other intracranial complications of otitic origin, it would be better discussed and indexed under the title of Gradenigo's triad or syndrome.

In 1904 before the congress at Bordeaux, Gradenigo described a group of symptoms or a triad characterized by, (1) acute otitis media with or without mastoid symptoms; (2) isolated paralysis or paresis of the abducens nerve corresponding to the side of the diseased ear; (3) excruciating and persistent pain localized in the frontal, temporal and parietal region of the same side.

In presenting the reports of two cases characterized by this syndrome, one after a mastoideetomy and the other treated without operation and both recovering, eonelusions eannot be drawn. It may be stated however that reeovery of an isolated abdueens nerve paralysis abdueens nerve paralysis is, aeeording to reports available in the literature, the general rule.

Case 1. P. W., St. Paul, age 17 years, first seen January, 1916, gives a history of a reeent attaek of influenza, eough, nasal diseharge and at first first a serious discharge from the left ear, this later beeoming purulent, with pain over the mastoid bone. Shortly thereafter he notieed that on looking at any light he saw two images; he was dizzy when walking and nauseated the greater part of the time.

Upon examination I find the patient emaeiated, pale, hemoglobin 70, nrine dark amber eolored, with no albumen and no casts; temperature 103; frontal and ethmoid sinuses diseharging a yellow muco-purulent matter; purulent discharge from left ear through a small perforation in tympanum; vision normal with the exeeption of diplopia and inability to move left eye outward beyond the middle line. Ophthalmoseope shows no ehange in the fundus; pupils reaet to light. Two days thereafter he eomplained of sharp pains radiating forward toward eye and side of head; to overeome the diplopia he kept the left eye elosed; he eame to my offiee for a period of two weeks and the nasal sinuses and ear were treated.

February 18th a mastoid operation was performed; the eells and antrum were eompletely filled with granulation tissue, although the bone over the sigmoid sinus appeared normal, it was removed; a thin eoating covered it. Nothing further was done and the eavity was packed as with an uneomplieated mastoid operation. At the time of operation the emperature was 103, after the operation the temperature fell to 99 degrees.

Thereafter, for several days the temperature rose and fell until it beeame normal; three days after operation the temporal and parietal pain diminished but the diplopia remained; he was kept for a period of two weeks in the hospital and then reported at my offiee for dressing. The diplopia lasted for a period of three weeks but the motility of the eye outward did not completely correct itself for some time, for when looking at more aeute angles outward he eontinued to see double images. It required three months for complete reeovery from the operation and before the musele movements beeame normal.

Case 2. Wm. M., Stillwater, Minn., male, age 12 years, first seen January 20th, 1919. He has reeently reeovered from searlatina, is now in a eonvaleseent state, pale, anemie and thin, giving the history of a profuse mueo-purulent diseharge from the right ear for some time. The mastoid is tender, the auriele protrudes and great pain pain radiates from the ear over the temporal region to the eye and eye lid. Images appear double; he keeps affeeted eye elosed and the head turned toward the left side; he is nauseated a greater part of time, dizzy when walking and at times drowsy.

Examination Hemoglobin 60; urine contains a large amount of albumen, hyalin and granular casts; ear discharging muco-purulent secretion, posterior superior wall of auditory canal normal, small perforation in tympaum, mastoid tender; right eye cannot be rotated outward beyond the median line, a complete paralysis of the external rectus muscle; lid on affected side swollen and reddened from lachrymation; at no time during the period that I saw the patient did he have an elevated temperature. On the contrary it was always subnormal. The ophthalmoseope showed the dise slightly swollen.

Treatment—Operation was urgently advised but the parents would not eonsent. He was plaeed in the hospital for one week and treated eonservatively; the ear was douched every hour with saline solution, the tympanic opening enlarged and an ice bag put to his head. Thinking the treatment could be carried out equally as well at home and by reporting to the offiee he left the hospital contrary to adviee. Basham's mixture was then preseribed and he was instrueted to be nnder his family physician's observation for the nephritis. During the time he was nnder my treatment the tympanum was kept wide open by repeated paracentesis, the canal washed out with saline solution and into the middle ear two minums of phenol neutralized with gum eamphor were injeeted every

other day with a small syringe. There is a slight burning after this injection which lasts for a few minutes. A wick saturated with this solution was used as a drain in the canal; negative pressure was used to remove the secretion for the middle ear and the right eye was bandaged; dark glasses gave some relief. March 17th he stated the diplopia was absent; during the course of this treatment the aural discharge gradually diminished; when last seen April 4th the diplopia had disappeared, the gemperoparietal pain and aural discharge had ceased and the tympanum had healed. April 15th the boy's father wrote that his condition was very gratifying and on May 13th he writes from the East where he now resides in a similar vein.

Considering these cases from the symptoms existing, both presented: (1) suppurative otitis media; (2) paretic strabismus; (3) diplopia; (4) intense pain on affected side radiating toward the front; (5) impairment in motility of affected eye; (6) dizziness; (7) abnormal position of head. Case 2 had subnormal temperature and drowsiness, indicative of uremic poisoning or cerebral involvement; likewise the classical symptoms of mastoid involvement, redness, swelling over mastoid, pain and discharge. But these are not the dangerous cases for this is more indicative of a mastoid periostitis.

The common routes of infection into the cranial cavity are either by way of the inner wall of the mastoid or through the roof of the antrum or tympanic cavity. The fact that in Case 1 the inner wall of the mastoid was not diseased and apparently the mastoid involvement of Case 2 was not severe would make it appear that these cases originated through extension from the tympanic cavity.

An extensive review of the literature relating to the subject and occurring up to 1910 was made by C. E. Perkins and published in the Annals of Otology, Rhinology and Laryngology. Out of 95 cases collected eleven died from meningitis; of the eighty-four remaining, recovery of the abducens paralysis occurred in 67, probable recovery in 5, partial in 4, no improvement in 1 and not stated in 6; of 29 cases of abducens paralysis complicating mastoiditis and operated upon there were 27 complete recoveries, 1 death, and 1 failure; of 31 cases not operated upon there were 25 recoveries, 3 failures and 4 deaths.

In a recent case reported both by Dr. P. D. Kerrison and Dr. John M. Wheeler and in which a mastoid operation had been performed, the paralysis of the external rectus recovered the third day after operation and steadly improved thereafter. In two cases reported by Dr. O. Stiekney in the Laryngoscope July, 1919, the paralysis of one recovered in two weeks after operation and in the other there was a steady improvement.

Since intracranial lesions of otitic origin always spread by contiguity from the primary focus, the question arises as to what the muscle palsy is to be attributed. Gradenigo states it is due to a localized meningitis in which the apex of the petrous bone becomes involved; Urbantschitch, Rimini and Geronzi believe the disturbance produced reflexly from Deiters nucleus; Bartels concludes that paralytic strabismus in ear diseases is the result of direct nerve lesion brought about by extension of inflammation from the tympanic cavity or labrynth to the meninges. The subject of nystagmus relates directly to the above theory, for certain forms of squint are due to labrynthine stimuli.

Irritation of one auditory apparatus will cause rotation of both eyes toward the opposite side with marked rotation of the adjacent eye, thus simulating an abducens palsy of that eye, the position lasting but a few seconds. No doubt others have had occasion to note the existence of diplopia following a simple mastoid operation, notwithstanding the fact that the cranial cavity had not been entered or any other trauma administered to the part other than the concussion produced from the mallet and chisel during the operation. In this condition, no doubt, an intense meningeal hyperemia takes place in the region of the petrous bone as a result of the concussion.

Why then the rarity of this complication and syndrome? Considering the great number of cases of suppurating otitis media with mastoid complication occurring each year, can the causative factor not be due to some anatomical anomaly in the course of the sixth nerve?

The abducens nerve originates from an oval

gray mass of nerve cells in the fasciculus teres in the floor of the fourth ventricle, close to the median groove and in front of the transverse striae; it passes down through the pons parallel with the septum and emerges from the transverse groove between the pons and the anterior pyramid, being connected with both. From this point it passes forward and upward as a cord. At a point in the middle fossa it pierces the dura for a short distance, protected only by its sheath. Piercing the dura behind the body of the sphenoid bone it enters the cavernous sinus along the inner wall external to the internal carotid artery emerging through the sphenoid fissure in its lower nasal part to be distributed to the external rectus muscle. The close relationship between the sixth nerve and the fifth nerve which passes over the apex of the petrous portion of the temporal bone and the developed Gasserian ganglion at this point explains the tempero-parietal pain on the affected side.

From the anatomical study as above outlined, it must be concluded that the cause for the complication is due to an abnormal relationship of the abducens nerve with the petrous bone and the fifth nerve, the anomaly made evident by the aural infection spreading by way of the tympanic cavity.

A paralysis of the abducens nerve cannot be treated as an entity, but as an acute manifestation of a focal infection situated within the cranium and as with other symptomatic conditions it must be approached with respect to the other attending factors.

A fatal outcome is not governed by a wide distribution of the pathologic process, for meningeal inflammation of contignous etiology is more favorable for recovery than a meningitis secondary to labrynth infection. Primarily, then, it is to be considered as a localized otitic meningitis and as such the prognosis is more favorable.

In cases presenting definite mastoid symptoms, operation is indicated early. With others a free drainage through the tympanic membrane is imperative. Suppurative otitis media is not fatal per se, but as the result of complicating intracranial infection.

DISCUSSION

DR. H. I. LILLIE, Rochester: Gradenigo originally reported fifty-three cases of patients with homolateral abducens paralysis in acute mastoiditis. Five of these cases were examined at post-mortem and the cause of death was meningitis. In three cases a localized abscess was found at the apex of the temporal bone; the petrous portion was unusually pneumatic. Infection had spread along the bony portion of the eustachian tube to Dorello's space in which the sixth nerve is extradural.

Wilkinson suggests stripping the dura over the petrous portion in order to drain this region, and this has been done in most cases presenting this syndrome.

Gradenigo's description of the pathology; that is, localized meningitis or abscess seems the most reasonable, despite the spontaneous cures reported.

My personal experience has been the observation of three cases presenting this particular syndrome. One case which Dr. Shambaugh has reported elsewhere, occurred in which an abducens paralysis followed injury to the carotid artery in doing the radical operation. Another case, of brain tumor with a typical syndrome, in which there was a chronic suppurative otitis, followed the radical operation and on exploration of this apex region the patient's pain was greatly relieved. He died several months after from a tumor originating in this region. A recent case, in a baby sixteen months old, where there was a double syndrome; that is, both sides. The patient recovered but is deaf, apparently. Thus it is seen that the syndrome can be present in pathology other than infection.

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EDITORIAL

THE MINNESOTA STATE MEDICAL ASSOCIATION

The program of the annual meeting in St. Paul this month which appears in this issue reflects great credit on the program committee. The subjects are well distributed and the speakers representative. It is to be regretted that more physicians from the smaller cities and country districts did not avail themselves of the opportunity to take an active part in the program.

Three visitors will add considerable interest to an already attractive schedule. No surgeon in the country is better known than Dr. Joseph A. Blake of New York. His activities in the American Ambulance at Neuilly, outside of Paris, in the early days of the world war, established new methods in the handling of fractures which methods were later adopted by our medical corps abroad. It is difficult to measure the value of such service as he gave for his methods were preventive as well as actively surgical. He will speak on "The Handling of Fractures."

The speaker on the medical side, Dr. Joseph L. Miller of Chicago, is well known as a research worker, internist and teacher. He came into additional prominence during the war when he was summoned to Washington from the base hospital at Camp Dodge where he was in command, to become the Executive Officer of the Department of Reconstruction. Dr. Miller possesses an unusual combination of personal qualities and will be heartily welcomed by his many friends in Minnesota. He will clear up some of the difficulties in medical diagnosis.

We are told that a treat is in store for us in the form of an address from a representative of the American Red Cross. We are to be given the details of the Red Cross Peace Program. This remarkable organization which did such incalculable world wide good during the war has seen the vision of its possibilities for good along public health lines in peace times. This is an international program. We as physicians are actively interested more particularly in what this program means for our country.

The regular program will contain a medical symposium on tuberculosis and a surgical one on local anesthesia and will cover the field remarkably well in both branches.

It has been advocated that the association appoint a censor committee to pass on each paper before it is read at an annual meeting. At present the chairmen of the sections are more or less responsible for the programs in their sections. While anyone who has a subject to present before the meeting is invited to take part, it is the duty of the chairman to prevent duplication and arrange the best program possible. Wouldn't it be well to do away with any personal element which occasionally becomes apparent when the chairman has to refuse a place on the program, by having a censor committee? At present only the author and his subject are known to the section chairman in advance. A man's message on any particular occasion does not always come up to the mark.

When it comes to the publication of articles there is a further weeding out process by the Editing and Publishing Committee. This does not prevent rejected articles from appearing in other journals with the stamp of the Minnesota State Medical Association attached.

THE AMERICAN ROENTGEN RAY SOCIETY

It is proper that attention should again be called to the meeting of the National X-ray Society at Rochester and Minneapolis this month. The Roentgen Ray is of use either diagnostically or therapeutically in every branch of medicine. For this reason every physician in Minnesota who possibly can should take advantage of the opportunity afforded by this meeting to post himself on the subject of X-ray and its sphere which is daily broadening. Roentgenologists will be here from all over the country and many new ideas will most centainly be offered.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

The annual meeting of the State Association will take place Wednesday, Thursday and Friday, September 29, 30 and October 1, 1920. All the meetings will be held in the Old State Capitol Building, but headquarters will be at the St. Paul Hotel.

The House of Delegates will convene at 2 o'clock, Wednesday afternoon, September, 29th.

The first scientific session is scheduled for Thursday morning at 9 o'clock. Thursday afternoon the joint session will be addressed by Governor Burnquist of St. Paul. Immediately following this Dr. Joseph A. Blake of New York will give an oration in surgery and Dr. Joseph L. Miller of Chicago will give an address on "Some of the Present Problems in Internal Medicine".

The third scientific session will begin at 9 o'clock Friday morning and at the last session Friday afternoon, President Adair will give his address.

A representative of the American Red Cross will give an address on the Peace Program of the Society.

A smoker Thursday evening will be devoted to distinctly non-scientific subjects.

Special entertainment is to be provided for the ladies.

Hotel reservations should be made through Dr. G. K. Hagaman, Lowry Building, St. Paul.

Programs and detailed information will be mailed to the members a few days preceding the meeting.

TENTATIVE PROGRAM OF MEDICAL SECTION STATE MEDICAL ASSOCIATION

Dr. E. L. Tuohy, Duluth, Minn.—"A Dental and Medical View of the Relationship between Alveolar Infection and Constitutional Disease."

Dr. F. C. Rodda, Minneapolis — "Hemorrhagic Diseases of the New-born".

Dr. L. G. Rowntree, Mayo Clinic—"Diabetes Insipidus and Water Balance in the Body".

Dr. G. D. Head, Minneapolis—"Acute Lymphatic Leukemia".

Dr. Walter Sheldon, Mayo Clinic—"Traumatic Ulnar Neuritis—a Neurological Study".

Dr. Max Seham, Minneapolis—"Cardiac Disease in Childhood".

Dr. C. E. Riggs, St. Paul—"Three Neuropsychiatric Notes—Epilepsy, Lethargic Encephalitis and The Dementia Praecox Syndrome". Discussion: Dr. C. R. Ball, Dr. S. Marx Whité.

Dr. E. T. F. Richards, St. Paul—"Study of the Action of Camphor".

Dr. A. T. Henrici, University of Minnesota—"Fungus Infections".

Dr. J. L. Miller, Chicago, Ill.—"Some of the Present Problems in Internal Medicine".

Dr. W. P. Larson, University of Minn.—"The Use and Abuse of Vaccines".

SYMPOSIUM: "The Diagnosis and Treatment of Early Pulmonary Tuberculosis".

Dr. F. W. Wittich, Minneapolis—"Classification and Symptomatology".

Dr. J. W. Bell, Minneapolis—"The Physical Signs".

Dr. W. R. Ramsey, St. Paul—"Symptoms and Diagnosis in Childhood".

Dr. F. S. Bissell, Minneapolis—"The Roentgen Diagnosis".

Dr. W. J. Marcley, Minneapolis—"Treatment".

SURGICAL SECTION

Dr. Joseph A. Blake, New York—Oration in Surgery on "The Mechanical Treatment of Fractures".

Dr. Harry P. Ritchie, St. Paul—"Treatment of Hare-lip and Cleft-palate".

Dr. R. E. Farr, Minneapolis; Dr. Arthur Bratrud, Minneapolis; Dr. S. R. Maxeiner, Minneapolis—"Symposium on Local Anaesthesia".

Dr. E. Starr Judd, Rochester—"Cysts of the Pancreas".

Dr. W. E. Sistrunk, Rochester—"Mixed Tumors of the Parotid".

Dr. J. Pemberton, Rochester—"Surgical Considerations of Sub Sternal and Intrathoracic Thyroid".

Dr. C. H. Mayo, Rochester—"Cholecystectomy without Drainage".

Dr. T. L. Chapman, Rochester—"Factitious Toxicity of Previously Simple Goiters".

Dr. Arthur Strachauer, Minneapolis—"Surgical Treatment of Cerebellar Hemorrhage in the Newborn".

Dr. William R. Murray, Minneapolis—"The Diagnosis and Indications for Operation in Acute Mastoiditis".

Dr. B. A. Pratt, Minneapolis—"The Smith-Indian-Fisher Intracapsular Operation for Cataract."

Dr. Frank E. Burch, St. Paul—"Ocular Tuberculosis".

Dr. L. W. Morsman, Hibbing—"The Uses and Advantages of Electric Driven Bone Surgery Equipment".

AMERICAN ROENTGEN RAY SOCIETY

The annual meeting of this national society will take place September 14th to 17th inclusive. A preliminary session will be held at Rochester on Tuesday, September 14th and members and guests will come from Rochester to Minneapolis by special train on Tuesday evening. The meeting will be resumed at the Hotel Curtis, Minneapolis, September 15, 16 and 17, 1920. An attendance between five and six hundred is expected.

Dr. Robert Knox of London, England, who is a well known radiologist will take part in the meeting. Dr. Walter Alvares of the University of California will give the Caldwell Lecture on "Perstalsis in Health and Disease".

The program includes:

Dr. W. T. Bovie: "A Rational Basis for Sensitometry".

Dr. Dallas B. Phemister, Chicago: "Studies on the Reduction of Bone Density".

Dr. W. H. Stewart, New York: "A Revised Estimate of the Value of Pneumoperitoneum".

Dr. G. E. Pfahler, Philadelphia: "New Roentgenographic Technique for the Study of Thyroid".

Dr. Kennon Dunham, Cincinnati: "A Review of X-ray Chest Examination".

Dr. Preston M. Hickey, Detroit: "Paper on Mastoids".

Dr. W. W. Watkins: "Syphilitic-Tuberculous Symbiosis in the Lungs".

SIOUX VALLEY MEDICAL ASSOCIATION

At the twenty-fifth annual meeting of the Sioux Valley Medical Association at Sioux Falls, S. D., June 23 and 24, the following officers were elected: President, Dr. Ernest A. Jenkinson, Sioux City, Iowa; Vice Presidents, Drs. Charles L. Sherman, Luverne, Minn. and Goldie E. Zimmermann, Sioux Falls, S. D.; Secretary, Dr. John A. Dales, Sioux City, Iowa; Treasurer, Dr. Walter R. Brock, Sheldon, Iowa.

CAMP RELEASE DISTRICT MEDICAL SOCIETY

The regular July meeting of the Camp Release District Medical Society was held at the Log Cabin, Ramsey State Park at Redwood Falls, on July 22nd.

After disposing of the regular routine of business the Society had the pleasure of listening to a paper by Dr. Earl R. Hare of Minneapolis, which was followed by a general discussion by the members present.

At the conclusion of the meeting the visiting members and their families were entertained at dinner at the Hotel Ramsey by the local medical fraternity of Redwood Falls.

The officers of the Society are:

R. C. Adams, President, Bird Island.

M. M. Hauge, Vice President, Clarkfield.

H. E. Peterson, Secretary-Treasurer, Granite Falls.

TRI-STATE DISTRICT MEDICAL SOCIETY

The annual assembly of this society whose membership includes the entire three states of Iowa, Illinois and Wisconsin will be held at Waterloo, Iowa, October 4, 5, 6, 7, 1920. The physicians of Minnesota who are in good standing in their State Societies are most cordially invited to attend the meeting, and participate in the program. Entertainment will be furnished for the doctors' ladies. A large number of essays and discussions will be furnished by the physicians of the middle west. Among the prominent physicians who have been invited and who have accepted places on the program are the following: Drs. George W. Crile, Cleveland, Ohio; Harvey Cushing, Boston, Mass.; Robert T. Morris, New York City; Robert B. Osgood, Boston, Mass.; Lewellys F. Barker, Baltimore, Md.; Harlow Brooks, New York City; Alfred Stengel, Philadelphia, Pa.; William Engelbach, St. Louis, Mo.; Leonard G. Rowntree, Mayo Clinic; John F. Binnie, Kansas City, Mo.; Hubert Work, Pueblo, Colo.; Commander William S. Bainbridge, U. S. Navy, New York; Surgeon-General Hugh S. Cumming, U. S. Public Health Service, Washington, D. C.; Charles L. Mix, Chicago, Ill.; Carl B. Davis, Chicago; Daniel R. Carman, Mayo Clinic, Rochester, Minn.; and General John J. Pershing, Washington, D. C.

OBITUARY

DR. GEORGE W. McINTYRE

Dr. George W. McIntyre of St. Peter died July 11th, 1920 at the age of 67. He was born at Cleveland, Ohio, September 28, 1853. The family continued to make their home at Cleveland until 1857 when they moved to Wisconsin where they lived until 1861. Dr. McIntyre received his elementary education in the schools of Wisconsin and also attended an academy at River Falls. He received his medical education at the Minnesota Hospital College, Hamline University, St. Paul. After some years at the St. Peter State Hospital as assistant physician, he engaged in private practice in the city of St. Peter.

Dr. McIntyre is survived by one daughter, Miss Millie McIntyre, who is a nurse at the Johns Hopkins hospital at Baltimore. He also has one brother Loranus McIntyre of River Falls, Wis.

DR. E. E. WELLS

Dr. E. E. Wells of Stillwater died at his home in that city on May 17, 1920, after a week's illness with pneumonia.

Ernest Eldred Wells was born on a farm near Rockford, Ill., on Dec. 8, 1870. He attended a country school and then the high school at Winnebago and a business college at Rockford. He studied medicine

at Northwestern University, graduating in 1898. Thereupon he came to Stillwater, Minn., where he was interne at the City Hospital for one year. In his early practice Dr. Wells was temporarily located at Spring Valley, Wisconsin and Barnum, Minnesota, after which he practiced for two years at Moorhead, Iowa. In 1903 he located in Stillwater, which continued to be his field of labor for the rest of his life. Dr. Wells held several public offices. At the time of his death he was county physician and formerly he was coroner of Washington County and an alderman of Stillwater. He was a member of the Minnesota State Medical Association and the Washington County Medical Society, at one time being secretary of the latter, and was active in its last reorganization in 1917. He was an ardent member of Masonic organizations and was affiliated with several other fraternal orders. During the World War Dr. Wells served as a member of Medical Advisory Board No. 52. His ambition was to enter the military service, but he was disqualified for physical reasons.

On August 5, 1903, Dr. Wells was married to Miss Eva McLaggan of Stillwater, who survives him and is patiently bearing a double burden, she having been disabled for a number of years by illness. They have two children, Adele, age 14, and Janet, age 10. The doctor is also survived by one sister, Mrs. A. E. Evans of Hunter, Wash. His mother died when he was sixteen and his father lived to the ripe age of 83, passing beyond just three months before the son. Of late years the father required a great deal of surgical as well as medical attention and Dr. Wells was at his side continuously at the Rockford home during the last six months, except for occasional visits to his family in Stillwater.

DR. GEORGE L. GATES

Dr. George L. Gates, pioneer physician of Winona, died at the home of his brother in St. Paul, July 4, 1920. He was 82 years old and practiced in Winona for 40 years. His wife died 22 years ago. He was a member of the G. A. R. and was a Mason. He was born in Connecticut and came to Minnesota shortly after the Civil War.

MINNESOTA PUBLIC HEALTH ASSOCIATION COLUMN

By Dr. H. W. Hill, Exec. Sec. M. P. H. A. Shubert Building, St. Paul, Minn.

THE WINTER'S PROGRAM

Beginning now, and growing we hope to a climax in December, the next great enterprise of the Minnesota Public Health Association is to engineer such a Seal Sale in Minnesota as will put definite Public Health progress next year as far beyond that of this year, as this was beyond that of the year before.

The intensive campaign is in December, preceding Christmas, but the preparations for it are now going on quietly, widely—we hope with a grip on the situation never before in our power.

The other great enterprise for the Winter contains three subdivisions: one, the securing of some progressive public health legislation; another, the prevention of legislation of a retrogressive nature; finally we hope to see developed during this Winter a closer alignment of the State Medical Society with the public health movement—a direct taking part by the medical profession through its representative state body of a portion of the state public health work, as the American Medical Association takes a part in national matters.

This will necessarily consist in cooperation with the public in some line of medical service. As suggested in a previous article, the first thing to do is for the County Medical Society to get in touch with the public, county by county, through the County Public Health Association. Out of that should grow the second step; a cooperative service in each county, perhaps along the general line of developing the periodic examination idea. This is the way to prepare to meet, even to forestall, the chaos which nationalized medicine, not properly prepared for, is likely to precipitate.

NEW AND NON-OFFICIAL REMEDIES

During July the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Armour & Co.:
- Tablets Anterior Pituitary 5 grains.
- Tablets Ovarian Substance 5 grains.

Hynson, Westcott & Dunning:
- Lutein, Sterile Solution of
- Ovarian Residue—H. W. D.
- Tablets Ovarian Residue—H. W. D.

Merck & Co.:
- Bengyl Benzoate (Merck).

Organic Salt & Acid Co.:

Benzyl Benzoate (Organic Salt & Acid Co.)

Seydel Manufacturing Co.:
Benzyl Benzoate (Seydel).
E. Fougera & Co.:
Riodine.

Pollen Antigen-Lederle (Fall Type).—A liquid obtained by extracting equal parts of the pollen of ragweek, goldenrod, wormwood and maize. Each cubic centimeter contains 14,000 pollen units (a pollen unit is the equivalent of 0.001 Mg. of pollen). This liquid is made into fifteen different dilutions. The product is supplied in packages containing the fifteen dilutions (to be used for prophylactic treatment), in boxes containing five of the dilutions (series A, B and C, respectively, and in packages containing a single tube (for diagnostic use). Lederle Antitoxin Laboratories, New York.

Whole Ovary — H. W. D. — The ovarian gland of the cow, including the corpora lutea, freed from extraneous matter and dried in vacuo. For actions and uses, see general article on Ovary (New and Non-official Remedies, 1920, p. 201). Whole Ovary —H. W. D. is sold in the form of 5 grain tablets only. Hynson, Westcott & Dunning, Baltimore.

Benzyl Benzoate—Abbott.—A brand of benzyl benzoate (see New and Nonofficial Remedies, 1920, p. 49) complying with the N. N. R. standards. It is also supplied in the form of Elixir Benzyl Benzoate —Abbott and Benzyl Benzoate Tablets—Abbott 2 grains. Abbott Laboratories, Chicago.

Benzyl Benzoate—Fritzsche.—A brand of benzyl benzoate (see New and Nonofficial Remedies, 1920, p. 49) complying with the N. N. R. standards. Fritzsche Brothers, Inc., New York.

Benzyl Benzoate—Merck.—A brand of benzyl benzoate (see New and Nonofficial Remedies, 1920, p. 49) complying with the N. N. R. standards. Merck & Co., New York.

Benzyl Benzoate—Organic Salt & Acid Co.—A brand of benzyl benzoate (see New and Nonofficial Remedies, 1920, p. 49) complying with the N. N. R. standards. Organic Salt & Acid Co., New York.

Ampules Ven-Iron Cacodylate.—Each ampule contains 0.03 Gm. (½ grain) of ferric cacodylate (see New and Nonofficial Remedies, 1920, p. 44). Intra Products Co., Denver, Colo.

Ampules Ven-Iron Cacodylate.—Each ampule contains 0.03 Gm. (½ grain) or ferric cacodylate (see New and Nonofficial Remedies, 1920, p. 44) in physiological solution of sodium chloride. Intra Products Co., Denver, Colo. (Jour. A. M. A., July 3, 1920, p. 35).

Diphtheria Toxin—Antitoxin Mixture (Gilliland).—Each cubic centimeter of diphtheria toxin-antitoxin mixture (see New and Nonofficial Remedies, 1920, p. 264) represents three lethal doses of toxin and approximately 3.2 units of antitoxin. Marketed in packages representing one immunizing treatment, and in packages containing ten treatments. Gilliland Laboratories, Inc., Ambler, Pa.

Gonococcus Glycerol—Vaccine (Lederle).—A suspension of killed gonococci in a vehicle of glycerol and physiological solution of sodium chloride. For a discussion of gonococcus vaccine, see New and Nonofficial Remedies, 1920, p. 283. Marketed in packages of fifteen vials containing progressive amounts of the vaccine (Jour. A. M. A., July 17, 1920, p. 177).

PROPAGANDA FOR REFORM

Acriflavine G H and Proflavine G H.—Acriflavine and proflavine have been admitted to New and Nonofficial Remedies. However, the products sold by the Heyl Laboratories as "Acriflavine G H" and "Proflavine G H" have not been accepted for New and Nonofficial Remedies because (1) their quality did not conform to the Council's standards and (2) in the advertising issued for these drugs the manufacturer failed to give the unfavorable as well as the favorable clinical reports that have been published (Jour. A. M. A., July 3, 1920, p. 51).

Antidote for Snake Poison.—No Anti-venom for snake poison has been accepted for New and Nonofficial Remedies. Experiments looking toward the production of anti-venom for snake poisoning seems to have met with some success, but the use of these products in therapy is still in the experimental stage. In general it has been shown that an anti-venom prepared for one species is not always effective when used against the venom of another species (Jour. A. M. A., July 3, 1920, p. 51).

Products of the American Organotherapy Co. — Dr. Alfred A. Lowenthal has announced a "Post Graduate Course of Lectures and Clinics" to the physicians of Chicago, Denver, St. Louis, Columbus, etc.—and incidentally brings to the attention of the medical world the alleged virtues of the products of the American Organotherapy Company. A few years ago, the American Animal Therapy Company of Chicago put out such products as Lymphoid Compound (Lowenthal), Ova Mammoid (Lowenthal) and Prostoid (Lowenthal), and these products were exploited to the public (Jour. A. M. A., July 3, 1920, p. 49).

Echitone and Echinacea.—A circular entitled "Skin Lesions of Unknown and Uncertain Origin" sent out by Strong, Cobb & Co. is devoted to the exploitation of "Echitone", stated to contain echinacea, blue flag and pansy. Several years ago, the Council on Pharmacy and Chemistry examined "Echitone" and rejected the product because unwarranted therapeutic claims were made for it and for other reasons. The drug echinacea has been claimed to be a "specific" for rattlesnake bites, syphilis, typhoid, malaria, diphtheria and hydrophobia. It has also been credited by enthusiasts with curative effect in tuberculosis, tetanus and exophthalmic goiter, and with the power of retarding the development of cancer.

The Council on Pharmacy and Chemistry examined the claims made for this drug and reported that there was no reliable evidence in substantiation of the claims made for it. Echinacea is one of the many vegetable drugs introduced by the eclectics without a rational basis for their use (Jour. A. M. A., July 17, 1920, p. 193).

Na Versus K.—Advantages of sodium over potassium salts: (1) **Rational therapeutics.** Sodium compounds are as efficient as, in many instances better than the corresponding potassium compounds. Potassium is more toxic. (2) **National aid.** Accustom yourself to use sodium, an abundant natural product of the United States. The home of potassium is Germany, which, to its own commercial gain, popularized potassium drugs. (3) **Price.** Sodium salts are cheaper. Potassium is, relatively speaking, a foreign substance in the body. Potassium and sodium salts are prescribed mainly for the effects of the radicle they carry. It is illogical, therefore, to administer potassium acetate or potassium bromid when sodium acetate or sodium bromid can more readily be given. In spite of the smaller demand, sodium salts are on the whole cheaper than potassium salts and, should the medical profession prescribe the sodium more generally, all of those that might be used in medicine would be less expensive than the corresponding potassium salt (Jour. A. M. A., July 17, 1920, p. 192).

Boracetine. — Boracetine (F. E. Barr & Co., Chicago) in 1919 was heralded as "The Guardian of Health". It was claimed to be "an all-around antiseptic, especially good for pyhorrea, sore gums, sore throat, etc., excellent for cuts, bruises, insect bites, skin eruptions and, in fact, any condition when an efficient healing agent and germ destroyer is needed". It was also recommended to "get rid of that 'dark brown taste'." Indirectly Boracetine was also claimed to be a preventive of consumption, scarlet fever, diphtheria, etc. From the analysis made in the A. M. A. Chemical Laboratory it appears that Boracetine is nothing more wonderful than **Liquor Antisepticus, N. F.** with a dash of formaldehyd. The moro "patent medicines" are analyzed the more obvious becomes the commercial wisdom of the nostrum interests to fighting formula disclosure. Secrecy and mystery are the "back bone" of the "patent medicine" industry (Jour. A. M. A., July 17, 1920, p. 192).

Chaulmoogra Oil in Leprosy.—The results obtained with the treatment of lepers at the leprosy investigation station in Kalihi, Hawaii, with the ethyl esters from chaulmoogra oil have been encouraging. It will require, however, some time to determine whether a real cure for leprosy has been discovered (Jour. A. M. A., July 24, 1920, p. 263).

Chemotherapy of Tuberculosis and the "Cerium Salt Treatment".—Koch studied the effects of many chemical substances, including a gold cyanid compound, on the growth of the tubercle bacillus in cultures, and concluded that all these substances remained completely inactive when tested upon the tuberculous animal. Compounds related to guaiacol and creosote came to have a widespread reputation as tuberculocidal agents without any one's taking the trouble to ascertain definitely whether they really had any particular capacity to injure tubercle bacilli in the test tube, the tuberculous animal or the consumptive patient, although the German manufacturing chemists provided innumerable proprietary derivatives of these drugs. Some time before the war, a "complex lecithin-copper compound" of unannounced composition was put forward in Germany. Another copper cure came from Tokyo, "cyanocuprol" of Koga. Other copper compounds, such as copper arsphenamine, also were brought out. But none of these copper compounds have settled the tuberculosis problem. Recently, newspapers have given publicity to the treatment of tuberculosis by the so-called cerium earth salts in France. It appears that a few observations have been made on the inhibitory action on the growth of tubercle bacilli of salts of cerium and some other rare earth metals. The inhibitory action was less than that observed in the past for other chemical substances, and there is no record of experiments to determine their effect on experimental tuberculosis. Possibly cerium earth salts help the tuberculosis; the evidence so far presented, however, is nothing to get excited about (Jour. A. M. A., July 24, 1920, p. 246).

More Misbranded Drug Products and Nostrums.—The following products have been the subject of prosecution by the federal authorities under the Food and Drugs Act: Seelye's Wasa-Tusa, Dr. Seelye's Compound Extract of Sarsaparilla, Seelye's Laxa-Tena, Seelye's Cough and La Grippe Remedy and Seelye's Fluorilla Compound (A. B. Seelye Medical Company) were misbranded because the therapeutic claims were unwarranted. Aspirin Tablets (Verandah Chemical Company) were misbranded because they contained no acetylsalicylic acid (aspirin). Dr. Grove's Anodyne for Infants (Smith, Klein & French Company) was misbranded because the therapeutic claims were unwarranted and because the carton failed to contain a statement of the quantity and proportion of morphine and alcohol contained therein. Cacapon Healing Water (Capon Spring Company) was adulterated in that it consisted in part of a filthy, decomposed and putrid animal and vegetable substance and misbranded because the curative claims were unwarranted. Seawright Water (Seawright Magnesian Lithia Spring Company) was adulterated in that it consisted in part of a filthy and decomposed vegetable substance (Jour. A. M. A., July 24, 1920, p. 261).

Benzyl Benzoate.—The chemical properties of benzyl benzoate have been known for years. Its therapeutic properties as an anti-spasmodic have been known only a short time. Before this new addition to our materia medica can be given thorough

clinical trial, it is necessary that the products be of a quality sufficiently pure for medicinal use. For the physician's protection, as well as for an aid to the manufacturer, the A. M. A. Chemical Laboratory, at the request of the Council on Pharmacy and Chemistry, has elaborated purity standards. It has also examined the market supply and found that, on the whole, the nonproprietary medicinal brands are of a satisfactory grade for clinical use (Jour. A. M. A., July 31, 1920, p. 335).

A Shotgun Mixture.—It is stated that the following prescription is used with success in "intestinal cases of a medical type": zinc sulphocarbolate, 0.5; bismuth subnitrate, 15.0; bismuth betanaphtholate, 8.0; camphorated tincture of opium, 15.0; syrup of acacia, 30.0;; elixir lactopeptine, to make 130.0. In this, the chief active ingredients are bismuth subnitrate and camphorated tincture of opium. The zinc sulphocarbolate is superfluous. The action of the bismuth betanapholate probably does not differ from that of bismuth subnitrate, and cinnamon water or simple elixir might as well be substituted for elixir lactopeptine (Jour. A. M. A., July 31, 1920, p. 335.)

OF GENERAL INTEREST

Dr. George McGreight of Albert Lea has returned from Siberia.

Dr. H. C. Ericksen of Stanley, Wisconsin, has located at Northfield.

Dr. H. V. Hanson formerly of New London has located at Hutchinson.

Dr. A. Shedlow who has just graduated from the University will locate at Gully.

Dr. R. I. Hubert formerly of St. Paul has moved from Bellflower to Los Angeles, Cal.

Dr. E. W. Hansen of Minneapolis was married to Miss Erna Gaustad of Minneapolis on July 11.

Dr. Harry E. McKibben of Hector was married April 10th to Miss Anna Edstrom of Omaha.

Dr. P. M. Hall, superintendent of the State Sanitarium has returned from the Adirondacks mountains.

The Trempealeau-Jackson-Buffalo County Medical society held a meeting the week of June 14th in Winona.

Dr. J. J. Heimark of Rochester has gone to Fargo to take charge of the Radium work in St. Joseph's hospital.

Dr. J. G. W. Havens of Owatonna has moved to Austin where he has become associated with the Austin Clinic.

Dr. and Mrs. J. Landenberger of New Prague are taking a trip to the coast and will return about September 1st.

Dr. D. H. Nusbaum of Lakefield has returned from Philadelphia where he took a post graduate in ophthalomology.

A physician is wanted at Good Thunder, Minnesota. Mr. C. G. Schroeder of that town will give particulars to those interested.

Drs. B. J. Branton and C. J. Ehrenberg of Minneapolis have moved to Willmar and have become associated with Dr. B. J. Branton.

Dr. Alberta M. Greene has returned from Siberia and will resume her former position on the staff at the State Hospital at Fergus Falls.

The Crookstone Clinic with offices in the Wallace Block, Crookston, has been organized by Drs. J. F. Norman, F. M. Dryden and Ralph L. Kirsch.

Dr. H. G. Blanchard, who for the last twenty-three years has practiced medince in Waseca has sold his practice to Dr. H. A. Miller of the Mayo Clinic.

Dr. Elias Porter Lyon, dean of the Minnesota Medical School, was granted the degree of Doctor of Laws by the St. Louis University, June 7, 1920.

Dr. H. E. Richardson, who has served as deputy coroner of Hennepin County for the last eight months, has resigned to enter private practice in St. Paul.

Dr. F. P. Silvernale, who has just finished internship at the City and County Hospital, St. Paul, has become associated with the Silvertsen Clinic of Minneapolis.

Announcement is made of the opening of a new school in Minneapolis, privately owned, for backward and nervous children. The school will be known as the Baker-Bartholomew School and will maintain an efficient corps of teachers. Dr. W. A. Jones and Dr. Bruce W. Jarvis, well known specialists of Minneapolis, will act as medical advisers.

Dr. Robinson Bosworth, President of the Mississippi Valley Sanatorium Association, who has been in Memphis, Tenn., since last fall, superintending the construction and organization of the Oakville Memorial Sanatorium, will soon return to resume his work as Executive Secretary of the Advisory Commission of the Minnesota State Sanatorium for Consumptives.

Those desiring space for exhibits at the State Medical Meeting may secure same by communicating with Dr. John S. Abbott, Lowry Building, St. Paul. Considerable space is still available.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH.

THOMAS A. PEPPARD
LA SALLE BLDG., MINNEAPOLIS

THE OPHTHALMOLOGICAL FINDINGS IN LETHARGIC ENCEPHALITIS, WITH A REPORT OF SEVEN CASES: Hiram Woods (Arch. of Ophth. vol. 48, No. 6) in his paper entitled, "Some Cases of Lethargic Encephalitis", treats in detail the ophthalmological symptoms in this condition in a manner that hitherto had not been made a special study.

Of the seven reported cases, two gave a history of an antecedent influenza although the third gave a doubtful history of this affection. In one of the cases there was an optic neuritis and this was of a low grade. The rarity of this latter finding is in accord with the observations of others and can be accounted for by the lack of inflammatory and pressure symptoms so characteristic of the disease. In three of the seven cases there was a severe impairment of accommodation, with pupils dilated, sluggish, and at times wholly inactive. In addition in one case, because of the age of the individual the accommodation could not be accurately tested although the pupils presented a similar condition. These four cases presented other defects; in one there was involvment of other branches of the third nerve, in two there was an implication of the sixth nerve, in three an involvment of the facial nerve. The spontaneous cure of the musculature of the globe both intrinsic and extrinsic is common although the paralysis of the intrinsic musculature is the last to disappear. In five of the seven cases there were nystagmoid movements, and in two of the total this symptom was the only ocular symptom. This nystagmus bore no definite relation to the axis of the voluntary movements of the eyes e. g. upon lateral movements of the eyes the nystagmoid motion might either be verticle or rotary.

In the explanation of these various muscular phenomena the author is inclined to accept the premises of Melland, namely that the symptoms vary according to whether the disease manifests itself as an encephalitis inferior or an encephalitis superior. He contends that in those cases showing ocular paralyses the condition is doubtless one of encephalitis inferior with lesions of the brain stem varying from the level of the anterior tubercles of the corpora quadrigemina, along the floor of the fourth ventricle to the level of the nucleus of the sixth nerve. The lesions are sometimes irritative sometimes inhibitory but never destructive. The paralysis of the intrinsic or the extrinsic musculature supplied by the third nerve is selective according to the group of ganglion cells involved. The nystagmoid movements may be accounted for by a lesion of the transverse fibers connecting the nuclei of one side with those of the other, or a lesion involving the posterior longitudinal bundle which connects the nuclei of the third, fourth and sixth nerves. In this connection a lesion of the association fibers cannot be excluded.

P. D. Berrisford.

RELATIONSHIP OF INFLUENZA TO CLINICAL PULMONARY TUBERCULOSIS: Martin F. Sloan (Sixteenth Annual Meeting National Tuberculosis Association, St. Louis). Science pretty generally recognizes that every individual who reaches the age of fifteen has been infected by living tubercle bacilli, the specific cause of every form of tuberculosis. Clinical tuberculosis in the adult, in the light of research and compared with acute illnesses may be said to be a secondary disease in that it is so often preceded by a more active pathological process. Without minimizing the importance of the tubercle bacilli in the campaign against tuberculosis more emphasis should be given the predisposing factors and more strenuous effort made to eradicate them. The elimination of alcoholism as a sociological problem is the hardest blow yet struck in the campaign. Campaigns against the acute illnesses, typhoid, pneumonia, small pox, scarlet fever, etc., have been waged for years and have been productive of results. Because of the periodicity of influenza in epidemic form not so much attention has been given it as its importance justifies.

Reviewing the statistics of patients admitted to Eudowood Sanatorium from October 1st, 1918, to September 30th, 1919, most of whom were examined by him prior to admission, the author found that of the 188 admitted 53 (28%) gave a history of having had influenza; 9 were known to have had clinical tuberculosis at one time or another, 14 gave a history of symptoms that made him feel they must have had clinical tuberculosis, but no diagnosis had been made; 30 (16%) denied any symptoms whatever referable to the lungs prior to influenza. Inasmuch as the influenza morbidity of Maryland paralleled that of two or three other states and that of the Nation at large, he suspected influenza had played the same role generally in activating tuberculosis. Subsequently, he sent a questionnaire to 90 sanatoriums scattered throughout the country and received complete and useful answers from 28. Of a total of 7,714 patients admitted to these 28 sanatoriums from October 1st, 1918, to September 30th, 1919, during the period most reasonable to expect the presence of definite post-influenza tuberculous cases, 2,098 (27½%) gave a history of having

had influenza; 416 had been diagnosed tuberculous prior to the influenza; 525 had had definite symptoms, but no diagnosis had been made; 1,157 (15%) denied any history or signs referable to the lungs prior to the acute illness. Thus it seems that influenza gave to the sanatoriums of the country 15% of the cases demanding treatment during the stated period. The author feels justified in saying that influenza has been the largest predisposing factor in activating the cases of clinical tuberculosis of today and every effort should be made to control and exterminate it. Sixty-five per cent of the post-influenza cases showed tubercle bacilli in the sputum. Patients with active advanced tuberculosis with a history of sickness extending back to an attack of influenza during the first epidemic are yet coming into the dispensaries and sanatoriums undiagnosed. Warning is given to physicians to regard with grave suspicion every patient with lung and constitutional symptoms dating back to the first or second epidemic of influenza. Repeated physical and sputum examinations should be made in every case and X-ray examinations should be resorted to when advisable. Many lesions thought at first to be residual pneumonia have yielded tubercle bacilli after numerous examinations. X-ray plates, besides showing a predominating non-tuberculous lesion near the base of the lung have shown an obscure tuberculous lesion at the hylus extending toward the apex.

THE ROENTGEN RAYS IN THE DIAGNOSIS OF APPENDICITIS: George E. Pfahler (Am. Jour. Roent., Feb. 1919) says that while in the majority of cases roentgenology is not necessary to make a diagnosis of appendicitis, yet there are a number of borderline cases where the symptoms are puzzling in which a complete roentgenological examination will give very valuable information and often prove absolutely the presence or absence of chronic appendicitis. He gives a lot of instructions as to his technic which may be worth repeating.

The patient is given a preliminary purge, preferably of a bottle of citrate of magnesia, at 9 p. m. on the evening before the contemplated examination and presents himself at 9 a. m. the following morning without breakfast, at which time a careful study is made of the gall bladder region as well as a lookout kept for any possible kidney stones. The chest is next viewed fluoroscopically to detect any abnormalities there which might have a bearing on the abdominal symptoms.

The patient is then given a drink of 2 ounces of barium in one pint of buttermilk and the stomach and duodenum are studied. He is viewed again 3, 4 and 6 hours after taking his barium meal and if the stomach and duodenum are negative he is seen again 8 hours after his first drink. At this time the material had entered the cecum and ascending colon and sometimes the appendix may be viewed. The patient is again seen 24 hours after his first drink, at which time the cecum and ascending part of the transverse colon are usually well filled and the appendix can often be demonstrated. Later the patient may be finally seen again, 48 hours after his first drink and if necessary at this time a barium enema may be given to recognize any constriction or filling defects.

The following diagnostic points are to be sought: 1. **Localized tenderness.** This is the most valuable sign of chronic appendicitis and may be elicited by palpation under the fluoroscopic screen or with the "distinctor." If the appendix is found filled with barium, pressure over the appendix causes pain and if the pain moves with the movement of the appendix we have a diagnosis absolutely confirmed. Furthermore, if the appendix is pathologic the tenderness, once found, is persistent throughout the course of the examination. Vague tenderness is most likely to occur when the appendix is retrocecal.

The author says, "If no tenderness is present and if at the same time the cecum is freely movable, I believe that no appendicitis exists. On the other hand, if there is localized tenderness over the cecum with fixation of the cecum and no visualization of the appendix, it very frequently means the obliteration of the appendix by an inflammatory exudate which prevents the appendix from filling with the barium meal.

"Localized tenderness with fixation of the cecum but without filling defect of the cecum is, I believe, a strong evidence of appendicitis."

Oftentimes the roentgenologist will find that the tender spot in McBurney's region supposed to cover the appendix is not over the appendix at all, but with the variation of position of the cecum and appendix, the appendix may be some distance away. This, of course, gives valuable aid in a differential diagnosis.

2. **Demonstration of the appendix.** Case, of Battle Creek, as demonstrated the appendix in 30 per cent of his cases, but there seems to be no unanimity of opinion among the roentgenologists as to the significance of the finding of a barium-filled appendix, some men saying that if the appendix is demonstrable it is evidence that it is pathologic. Case takes the middle ground, claiming that the appendix which can be filled with barium, if not actually pathologic, is at least potentially dangerous. Some authors agree with Case when the barium remains in the appendix 48 hours or more after it has passed out of the contiguous colon.

3. **Fixation.** A chronically inflamed appendix tends to become adherent either at its tip or along its course. 4. **Position.** Normally the position of the appendix is downward, but it may lie in any position and it is apparently proved that a non-adherent appendix may change its position during 24 or 48 hours by its vermicular movement. In general it may be said that if the appendix is found directed upwards it is more likely to be pathologic.

5. **Kinking.** If there is a constant angulation it is pathologic, i. e., due to adhesions. 6. **Constriction.** Constriction, dilatation or irregularity in the lumen are pathologic. 7. **Abnormal retention.** If the appendix remains filled with barium after the cecum and ascending colon have been empty, or even the entire colon is empty, it is pathologic.

CHAS. N. HENSEL.

HISTO PATHOLOGY OF BRAIN ABSCESS: Geo. B. Hassin, (Arch. Hem. and Psych., Vol. 111, No. 6). The author begins his article by describing the histopathologic picture in an acute brain abscess following otitis media. He then takes up the conditions he found in an eight year old indurated abscess. Here he found a connective tissue capsule one-quarter of an inch thick resembling the dura. The source of this connective tissue element he has determined to be the blood cells, lymphocytes changing progressively to fibroblasts and connective tissue cells. In the subarachnoid spaces and in the vessels of these brains he determined the presence of debris of lymphocytes, nuclei and lipoid substances, while no signs of inflammation could be made out in the pia-arachnoid itself. The experiments of Weed, who determined the course of absorption of Prussian blue precipitate and of Forrester who found india ink granules in the subarachnoid space after injecting it into cerebral substance are cited in support of his findings in brains with abscesses that the natural course of waste elements from the brain is by way of Virchow Robin's perivascular spaces toward the subarachnoid spaces.

J. C. MICHAEL.

ACUTE INFECTIOUS ENTERITIS WITH POLYNEURITIC SYNDROME: Farnell & Harrington (Am. Jour. Med Sci., July, 1920) describe an epidemic of acute infectious enteritis with polyneuritic symptoms which occurred at the Rhode Island State Hospital for Mental Diseases. In calling attention to this development, they refer to the work of Orr and Ross, in their experiments on the lymphogenous infection of the central nervous system and Rosenau's work on the selective action of bacteria on the tissues of the body. Homan and Laitnen's work with the injection of streptococci into the sciatic nerves of animals is also recalled particularly in relation to their accumulation in the lymphatic spaces of the nerve sheath, and their transmission along the nerve sheath to the spinal root into the meninges and from there into the peripheral zones of the cord.

Rather as a strange coincidence, the work of Orr and Ross was done experimentally with the staphylococcus. The series of cases described by the writers also shows the presence of staphylococci. The staphylococcus aureus varies greatly in its virulence and Rosenau has produced symptoms in the various tissues of the body by the use of staphylococci cultivated to various periods of time, concluding therefrom that there are statges in the evolution of all bacteria which will produce a body reaction for that particular stage in which it happens to enter the body.

The epidemic in question occurred between July 15 and August 6, 1917. Patients were promptly isolated and quarantined. Fifty-one patients were the subject of their study. The onset was characterized by typical acute gastro-intestinal disturbances, nausea, vomiting, diarrhoea with blood, elevation of temperature, prostration, headache and backache. The ensuing neuritic symptoms were of the peripheral type, with marked pain on pressure, with usual absence of the patellar reflex, and with marked asthenia. In a few cases there was complete paralysis. The first cases were the most severe and showed the slowest improvement. Cases were divided into three groups. Of these groups nineteen were found to have definite neuritic symptoms in addition to the gastro intestinal disturbance; seven of them showed the neuritic symptoms to a lesser degree, and twenty-one disclosed little or no evidence of a peripheral neuritis. Some of these cases are described in detail.

In an effort to ascertain the source of infection in the gastro-intestinal tract, cultures were made from the milk used at the institution and staphylococci were obtained in the cultures in rapidly growing colonies. These were also obtained in the excreta and in the discharge from the nose and throat. These organisms were also found in the urine and in the blood. They therefore believe the infection to be of hematogenous origin. Four of these cases came to autopsy and in each instance the liver was found to show signs of degeneration or focal necrosis. Sections of the peripheral nerves and of the mid-dorsal cord showed small hemorrhages between the nerve fibers as well as the nerve root attached to the cord. There was no evidence of involvement of the anterior horns. They conclude therefore that a staphylococcus infection was the cause of this syndrome; that it was introduced into the gastro-intestinal tract causing acute infectious gastro-intestinal symptoms; that staphylococcus septicopyemia resulted therefrom, and that the organism had a particular selective action upon the peripheral nervous system.

F. J. HIRSCHBOECK.

RECOVERY FROM TUBERCULOUS MENINGITIS AFTER TREATMENT WITH INTRASPINAL INJECTION OF ANTI-MENINGOCOCCIC SERUM: Hollis & Pardee (Arch. of Int. Med., July, 1920). Only forty cases of unquestionable tuberculous meningitis have been reported heretofore as terminating in recovery, and the authors are reporting four cases of the disease which have terminated in this way. During recent years the increased exactness of diagnosis of this disease due to the use of spinal fluid examination has resulted in a paucity of reports of cured cases. Since 1910 only eleven cases have been

reported as recovering with treatment. The criteria of diagnosis being the clinical course, the cell count and differential count of the spinal fluid, the finding of tubercle bacilli in the fluid, and the demonstration of the disease in inoculated guinea pigs, the last two being the only real proof. Several other cases are reported as having recovered in which positive evidence of the disease was not obtainable but in which the diagnosis rested upon the presence of tuberculosis elsewhere in the body or on the clinical course of the disease. The authors report two undoubted and two doubtful cases of tuberculosis meningitis with recovery.

The treatment used by authors other than the present writers have been chiefly in the way of repeated spinal puncture as recommended by Oppenheim. Tilli used autoserotherapy by injecting under the skin from one to three c. c. of spinal fluid every three days. With this technique he obtained recovery in a child 18 months of age. Aside from this case no positively tuberculous case has terminated in recovery with any specific line of treatment aside from the repeated spinal puncture.

In the cases reported by Hollis & Pardee, intraspinal injections of anti-meningococcic serum were given at three day intervals. Each one of the four recorded cases terminating in their recovery, out of seven cases in which it was tried.

The writers believe that the action of the antimeningococcic serum is based on two factors: firstly, in the way of adding certain anti bodies which the body is unable to develop itself; and secondly, by the introduction of a foreign protein in the form of horse serum, the irritative effects of the latter producing a cellular response through hyperemia about the site of the localized tubercles. As usual in these cases, the introduction of the serum was preceded by an evacuation of the spinal fluid.

In view of the ineffectual treatments heretofore employed, the writers suggest this as an alternative in cases of this type, as a result of the success attained at their hands.

F. J. Hirschboeck.

STUDIES ON EXPERIMENTAL PNEUMONIA. III. SPONTANEOUS PNEUMONIA IN MONKEYS. IV. RESULTS OF PROPHYLACTIC VACCINATION AGAINST PNEUMOCOCCUS IN MONKEYS: Francis G. Blake and R. L. Cecil (Jour. Exper. Med. May, 1920). The third paper of this series deals with the features of an epidemic of pneumonia among the monkeys utilized for the experimental work.

Paper four describes the experimental methods used in attempting to protect monkeys by means of vaccine. Large and small, single and repeated doses of vaccines failed to prevent the onset of a pneumonia, although the bacteremia was to some extent controlled and the mortality lower in the vaccinated animal. The leucocyte count was not influenced and the disease was not shortened either in experimental or spontaneous pneumonia. Apparently Type I vaccine confers no cross immunity against other types. Comparison is made between results obtained with lipo vaccines and saline vaccines. The latter seems more constantly to stimulate the formation of circulating antibodies. The age of the vaccine is an important factor in its antigenic value.

Because of the susceptibility of monkeys to pneumococcus infection, a strict analogy cannot be drawn between pneumococcus immunity in monkeys and pneumococcus immunity in man.

Thomas Albert Peppard.

INTRASPINAL TREATMENT OF SYPHILITIC AND PARASYPHILITIC AFFECTIONS OF THE NERVOUS SYSTEM: Marinesco (Revue Neurologique). This very interesting and important contribution by the well known Roumanian neurologist concerns itself chiefly with some of the author's new observations on the use of salvarsanized injections *in vivo* and *in vitro*. In the introduction the writer shows that it was he who first introduced the subdural form of treatment for nervous syphilis which he reported in the beginning of 1911 in the "Riforma Medica". He points out that Swift and Ellis began intraspinal treatment in 1912 and complains that American and German writers particularly gave Swift and Ellis the credit that was really due him.

Marinesco cites his researches on the introduction of coloring substance as trypan blue, methylene blue, etc., into the subdural space in the spinal cord and brain, also by the vascular route, the carotid artery and jugular vein. In the latter, coloration was observed only in the meningeal vessels and in the mere outer surface of the cortex, whereas in the former, using an idiot child and a dog, he observed immediate colorations diffused in the perivascular spaces, deep as well as superficial, in the adventitial sheaths, in the neuroglia cells and their prolongations. The base of the brain as well as the convexity showed the deep colorations. The author completed courses of treatment in fourteen cases of tabes and paresis, but cites three cases of paresis only. One, a well developed case, received two series of weekly intradural treatments for six weeks each, and she has been clinically cured for five years. Marinesco believes that the curative value of the serum lies in the presence of antibodies and not in the salvarsan. He believes that cases of paresis should be treated very early by the intravenous, intraspinous and intraventricular route.

J. C. Michael.

SURGERY

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THE CHLORINE ANTISEPTICS: Lee (Ann. of Surg., Vol. 31, No. 6) states that it was not until the use of antiseptics was approved in a scientific way by Wright, Dakin, Carrel, and Dehelley, with adequate analysis of the chemical, physiological, biological and pathological factors involved, that any knowledge of the subject was obtained.

That human tissues have a very definite vital resistance to bacterial infection has been conclusively demonstrated in the recent surgery of gunshot wounds. It is because of this vital resistance of the tissues that it has been possible to practice, in the war wounds, primary and delayed primary suture without the use of antiseptics. This resistance of the tissues is modified by constitutional disease, fatigue, shock, hemorrhage, and starvation, and the necessary degree is not always attainable. For these reasons surgeons will still require a certain amount of help from antiseptics in a definite proportion of infected traumatic wounds of civil life.

The new work on antiseptics may be said to be based upon the following principles: 1. Adequate active mass or concentration of the antiseptic, the necessary time of action and perfect contact between the reagents. 2. That the germicidal activity of all agents depends to an extraordinary degree upon the media in which they act, almost invariably the maximum in distilled water or Salt solution. 3. That chlorine could be presented to the human tissues without the destructive effect which has prohibited its use in the past, has been one of the surprising developments of the surgery of the war.

Dunham found that Dakin's solution of hypochlorite affected the tissues in an inverse proportion to their blood supply. The work of Hartwell and Butler corroborated this experimental work of Dunham. They showed that while no action of the hypochlorite solution was noticed on living muscle tissue, with its rich blood supply, the relatively avascular tendon and cartilage was rapidly dissolved unless protected by active suppuration and exudation. Clinical experiments during the past few years have shown that the hypochlorite solution can be used with impunity in peritoneal cavities in which there are abnormal exudates, as in appendiceal and pelvic abscesses. The presence in these peritoneal exudates of the necessary mass of chemical protein and its union with the active chlorine given off by the Dakin's solution results in the formation of a chemical barrier which protects the normal peritoneal tissues from the destructive solvent action of the hypochlorite solution.

The chemical reactions which occur when chlorine is presented to the tissues, as in hypochlorite solutions, are almost infinite. The chlorine as it splits off from the sodium compound, among numerous other reactions, unites with the protein to form an amino-radical to form more stable compounds which are known as chloramines.

The direct germicidal effect of all the chlorine antiseptics is dependent upon the liberation of their chlorine, and the combination of this chlorine with bacterial protein. The synthetic chloramines are more stable compounds of chlorine than the hypochlorite. The hypochlorite solutions are indicated where there are large masses of dead or devitalized tissue or profuse tissue exudate which cannot be removed by mechanical means. The chloramines are indicated where there is but little, if any, dead tissue, and where the wound exudate is moderate in amount.

E. M. JONES.

OPERATIVE INJURY OF THE COMMON AND HEPATIC BILE-DUCTS: Daniel N. Eisendrath (Surg., Gyn. and Ob., July, 1920). Acidents during operations on the bile-ducts are not infrequently due to variation from the normal distribution of the blood vessels of the biliary region as well as the unusual modes of union of the bile-ducts.

Observations familiar to the surgeon who wishes to minimize accidents to these structures are as follows: (1) In standard textbooks the cystic artery is described as a single vessel arising from the right hepatic shortly after the latter passes behind the main hepatic duct. The mode of union of the cystic and hepatic ducts is stated as being always of the acute, angular type. No mention is made of the plexus of veins and arteries lying on the surface of the common duct which cause an obstinate hemorrhage if overlooked. (2) The right hepatic artery varies greatly in its relation to the main hepatic and cystic ducts. (3) The variations in the course of the gastroduodenal artery and its branch, the pancreaticoduodenal, must be borne in mind. (4) The cystic artery does not always arise from the right hepatic artery after the latter crosses the right edge of the main hepatic duct. (5) There is a single cystic artery in only 88 per cent of persons. When single, the cystic artery does not always arise from the right hepatic. An overlooked cystic artery arising from the gastroduodenal may cause severe bleeding when accidentally divided. (6) In 12 per cent of persons there are two cystic arteries, both of which do not arise from the right hepatic. In the author's case, after one cystic artery has been ligated, severe bleeding occurred from an overlooked second cystic artery, and the hepatic duct was included in the grasp of the forceps while an attempt was made to control the hemorrhage from the retracted stump. (7) In 75 per cent of persons only, the cystic and hepatic ducts unite at an acute angle. When this occurs, the terminal two centimeters are firmly held together by fibrous tissue. In seventeen per cent the ducts pursue a parallel course before they unite. (8) Anomalies in the

hepatic and cemmon ducts may be found (a) as variations in the mode of union of the right and left hepatic ducts before the main hepatic duct is formed, (b) as accessory hepatic ducts or (c) as a double common duct. The author has made drawings which show such variations very clearly.

The author has collected fifty-one cases of injuries of the bile ducts, due either to errors in technic or to anatomical variations; he has divided them into four groups: (1) Cases in which the injury was recognized at the time of the operation or shortly thereafter, and immediate repair instituted. Twenty-six cases belong in this group. (2) Cases in which immediate or early repair of the injury was not successful, so that a secondary operation was necessary. There were four cases in this group. (3) Cases in which injury was overlooked at the time of the primary operation, so that only a secondary operation (usually for structure) was performed. There were fourteen cases in this group. (4) Miscellaneous cases.

In analyzing the fifty-one cases the author reveals five modes of injury; they are as follows: (1) A resection of the juncture of the cystic, hepatic, and common ducts (twelve cases). (2) Tear, ligation, or division of the main hepatic duct during cholecystectomy (nineteen cases). (3) Common duct resections (sixteen cases). (4) Anomalies of the hepatic duct (one case). The case reported by Kehr was one in which the right hepatic duct emptied into the cystic duct and was included in the clamp applied to the cystic duct. (5) Ligation or resection of the main hepatic or common ducts during efforts to grasp the bleeding stump of a single cystic artery. (Three cases).

The immediate mortality in the fifty-one cases was only three. Two patients died from pneumonia and one from cholemia. The late mortality was small One patient died from cholangeitis, seven months after the primary operation. There were forty-two complete recoveries following operative measures.

The ideal procedure of repair, and one only applicable to recent cases, is circular suture of the divided ends. End-to-end anastomosis with the aid of a rubber tube allowed to emerge through a separate opening in the duct or through the ampulla of Vater; that is, into the duodenum, ranks second in the choice of methods.

Reconstruction of the hepatic or common ducts over a rubber tube is preferable in cases in which there is a gap between the ends. The transduodenal drainage method of Voelcker has been employed in too few cases to judge as to its merits.

The author recommends the following precaution during operations on the gall-bladder and the bile ducts. (1) Placing the incision so that adequate exposure of the structures from the liver to the duodenum is obtained. (2) Identification of the supraduodenal portion of the common duct. (3) Separation of the ampulla of the gall-bladder from the common duct. (4) Exposure of the cystic duct and artery, main, hepatic, and common ducts.

FRED R. SANDERSON.

THE CALLOUSED ULCER OF THE POSTERIOR WALL OF THE STOMACH: W. J. Mayo (Ann. of Surg., July, 1920). From July 1, 1914, to July 1, 1919, 647 operations were performed in the clinic on 638 patients with gastric ulcers with an average mortality of 3.2 per cent. During this same five-year period 2,734 operations were performed on 2,720 patients with duodenal ulcers, with an operative mortality of 1.2 per cent. In twenty-eight of the 638 cases of gastric ulcer, the ulcers were multiple. Five hundred thirty-four gastric ulcers were located on or around the lesser curvature, eighty-five involved the posterior wall, nine were on or around the greater curvature, five were on the anterior wall, and five were not located definitely.

Of the eighty-five patients with ulcer on the posterior wall fifty-seven were males, and twenty-eight females; the average age was forty-three and nine-tenths years, the oldest was sixty-nine and the youngest eighteen. The average duration of symptoms was six years and six months; the average weight loss was 17.8 pounds. Anemia was present in all cases and marked in fourteen; the maximum hemoglobin was 66 and the minimum 26 Eight and two-tenths per cent of the ulcers on the posterior wall were in the pyloric third, 16.5 per cent in the cardiac third, and 75.3 per cent in the middle third. All the ulcers were of the chronic perforating varieties. The ulcer encroached on the pancreas in fifty-three cases and in a few of these on the liver, transverse colon, or a mat of adhesions. The pain was in the epigastrium in 56 per cent of the cases, in the back in 24 per cent, radiating to the right in 15 per cent, to the left in 8 per cent, and downward in 8 per cent. Food gave relief in fifty cases. There was slight to moderate obstruction in 35 per cent. Nineteen patients had gross hemorrhages, twenty-one vomited blood, and fifteen—whether or not they vomited blood—had blood in the stools. The clinical diagnosis was correct in seventy-one cases. The x-ray diagnosis was also correct in seventy-one.

The author states that it is difficult to determine the frequency with which chronic ulcer undergoes malignant degeneration, for clinical diagnosis is notoriously defective, postmortem evidence cannot prove the original disease, and operations which do not permit the actual excision of the lesion or removal of a specimen for microscopic examination cannot be relied upon. Aschoff points out that if the lesion is cancer originally the base of the ulcer will prove to be cancer, while Wilson and McCarthy showed that in cases of cancer on ulcer the cancer existed in the overhanging margins of the ulcer and not in the base.

Balfour showed that in cases of duodenal ulcer treated by gastro-enterostomy in which there had been hemorrhage before operation one in eight had hemorrhage afterward, while in cases of gastric ulcer hemorrhage occurred in only one in twelve. Balfour explains this by the frequent excision of gastric ulcer

because of the liability to cancer and the infrequent excision of duodenal ulcers. The death rate from duodenal ulcer in the first two years after operation is practically the normal death rate, and for the second two years it is less than normal, while for gastric ulcer the average death rate in the four years after operation is three times normal; a minority of the patients probably die from cancer of the stomach.

Methods of operative treatment are evaluated as follows: A. Cautery or knife excision is useful in cases of small ulcers. B. Gastro-enterostomy alone is at times warranted by the local or general condition of the patients. C. Resection by the methods of Billroth or the Polya-Balfour is suitable for pyloric ulcers, while the resection in continuity has been an excellent method for ulcers in the middle third. D. Excision and gastro-enterostomy is the logical procedure in the average case, but is sometimes followed by adhesions that immobilize the posterior wall of the stomach. After the posterior wall of the stomach is exposed through the gastrohepatic omentum the ulcer is detached from the pancreas and a specimen removed for microscopic examination. The ulcer is then excised with the cautery and the gap in the stomach closed; the suture line is covered with omentum. A posterior gastro-enterostomy completes the operation.

V. C. Hunt.

GYNECOLOGY AND OBSTETRICS

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THE NUTRITION OF THE FETUS: J. M. Slemons, (Yale Univ. Press). In this interesting monograph, the author considers pregnancy as a problem in nutrition in which metabolic forces favor growth and during which time there is a consistent increase in the mother's weight in excess of that represented by the growing fetus. He quotes experiments which prove that there is an actual storage of foodstuffs by the mother on an ordinary diet and concludes that the period of pregnancy is not one of sacrifice of the maternal organism for the development of the fetus. He notes that the necessary foodstuffs for fetal growth, nitrogenous material, carbohydrates, fat, oxygen, water, and inorganic salts, are to be found in the maternal blood. In studying the relation of the placenta he states that the embryonic demands are slight till after the 18th week, by which time the placenta is so simplified that the maternal circulation is separated from the fetal by only a thin layer of endothelial cells. There are two theories of placental interchange: 1. The "Vitalistic" which assumes activity of placental enzymes in the transmission of material. 2. The "Mechanistic" which assumes that the placenta plays a passive role as a semi-permeable membrane and that substances pass according to the laws of diffusion. He assumes as proven: that these laws apply to the passage of oxygen, carbondi-oxide, and gaseous anasthetics; that insoluble substances and blood cells, do not pass through a normal placenta; and that most soluble substances pass freely in either direction. Slemons' conclusions are based on a comparison of the content of maternal and fetal blood as regard to the essential substances at birth. Non-proteid nitrogen estimated by Folin's method is present in essentially equal amounts in both circulations which indicates that substances included in this class pass freely by diffusion. Amino acids which are crystalline are known to be diffusible and there is no evidence to indicate special function of the placenta in the passage of these substances. Urea, uric acid, and creatinin representing waste products have been shown present in equal amounts, that they pass through the placenta by diffusion. Carbohydrates as determined by the sugar content indicates a slightly higher per cent in the maternal circulation. This does not confirm the theory of a special enzyme activity in the placenta, but rather passage by diffusion with a reserve in the maternal circulation insuring a steady supply of carbohydrates. These are most essential since they are assumed to supply the fetal fats and lipoids. These latter, fats and lipoids show a marked difference with an excess in favor of the mother's circulation and he assumes that these substances do not pass through the placenta at all. Experiments are quoted which show that in the fetus, new fats are formed from carbohydrates derived from the placental circulation.

It is assumed that what has been demonstrated at full term is true at least from the 18th week when the placental structure is simplified and during the period of rapid fetal growth. During this time the placenta acts as a passive semipermeable membrane according to the mechanistic hypothesis. Amino acids and carbohydrates pass freely and the amounts reaching the fetus are regulated by the rate of consumption in its body. All fetal waste products pass through the placenta by diffusion and active elimination on the part of the mother is necessary to maintain adequate purification of the fetal blood. Unfavorable conditions of the mother, nephritis, and organic heart disease result in a concentration of these substances in both the maternal and fetal circulations with an unfavorable effect on the fetus.

The author concludes that the nutrition of the fetus involves two factors: 1. The activity of its own organs which has as yet not been studied and probably can not be exactly compared to postnatal function on account of the prominence of certain special organs during fetal life; thymus gland, etc. 2. The food supply from the maternal circulation as studied in this article offers certain practical conclusions. There is no special diet for pregnancy but

the mother should follow her previous habit and appetite. A diet which has previously been adequate will be sufficient during pregnancy. There is no justification for special diets to limit the growth of the fetus, for when actually carried out they will weaken the mother before the fetus is influenced. So long as the mother's health is maintained, no thought should be given to the size of the fetus, except to determine disproportion to the pelvis in selecting proper methods of delivery.

ARCHIBALD L. McDONALD.

VENOUS THROMBOSIS, PULMONARY INFARCTION AND EMBOLISM FOLLOWING GYNECOLOGICAL OPERATION: H. H. Hampton & L. R. Wharton, (Bul., Johns Hopkins Hosp., Vol. 31, P. 96). From an exhaustive clinical study of the records of the Johns Hopkins clinic, the authors, develop some interesting and suggestive data. 1. They find 205 cases of femoral thrombophlebitis complicating 21,000 abdominal and perineal operations. This is about 1 per cent which agrees with the experience of other clinics. No type of operation is free from this complication, but 34 per cent of their cases followed hysteromomectomy. It is estimated that from 3 to 5 per cent of such patients will have this complication. 2. In practically all of their cases there was a persistent post-operative fever to 99 or 100. An unexplained elevation of temperature should always arouse suspicion of an unrecognized thrombosis, and conversely an absolutely normal post-operative temperature may be taken to exclude this complication. 3. Femoral thrombophlebitis appears during the second or third post-operative week. It is usually accompanied by: pain, swelling, cyanosis, and fever, though local symptoms may be lacking—with extensive femoral thrombosis. 4. Pulmonary complications occured as follows: Infarction in 7 per cent and pulmonary embolism in 3 cases or about 1 per cent. The authors distinguish pulmonary infarction as the pathological and clinical condition following the dislodgement of an embolus not large enough to occlude the blood supply to an entire lobe, but sufficient to cause hemorrhagic infarction of a part of a lobe. Clearly cut clinical symptoms and signs result. Pulmonary embolism refers to the occlusion of a main branch of the pulmonary artery, involving at least an entire lobe, causing death before there is time for infarction to take place.

5. They studied 34 cases of infarction with 5 deaths, and present a complete clinical picture, emphasizing the following: (a) infarction is found most often in the lower right lobe including a cone-shaped area, with a fibrinous pleural exudate. Necrosis or abscess is rare except with infected emboli or pre-existing local disease. Absorption requires two or three weeks. (b) It is seen most often in patients under 40, (only one being over 50 who are considered good surgical risks. It occurs during the second or third week being preceded by low grade fever. symptoms are: Axillary pain, dyspnoea, dry cough, fever to 102 or 103, followed in 24 to 48 hours by physical signs; friction rub, occasional rales, and less often, dulness on percussion. (c) Important relations: 41 per cent had femoral thrombophlebitis either preceding or following the pulmonary infarction. Ten per cent had repeated attacks of infarction after an interval of a week or 10 days. Three cases developed extensive pulmonary embolism with one fatality. (d) Death was due to gangrene or abscess from spetic emboli or bland emboli lodged in an infected lung, to repeated infarction, or embolism. (e) Diagnosis: Only 10 per cent of their cases were recognized as such being diagnosed as pleurisy, pneumonia or bronchitis, apparently the condition has not attracted much attention in other clinics. This the authors feel is due to failing to consider the entire clinical picture. The attack is preceded by a low grade fever and is frequently associated with evident thrombophlebitis. The symptoms and signs suggest a dry pleurisy rather than pneumonia or bronchitis. 6. Post-operative pulmonary embolism. The authors have studied 21 cases of which 19 were fatal. Of 205 instances of thrombophlebitis in 21,000 operative cases, there were only 3 of pulmonary embolism with but one fatality. Hence it is fair to assume that there is but slight danger of fatal pulmonary embolism complicating femoral thrombophlebitis.

Extensive embolism may complicate any type of gynecological operation, it occurs earlier than the usual thrombophlebitis or pulmonary infarction, and is preceded by low grade fever indicating deep seated pelvic vein thrombosis which condition was demonstrated in 85 per cent of the author's cases. They explain that pelvic vein thrombosis is more closedly associated with or due to trauma, contains less fibrin, and that fragments are more easily dislodged into the circulation than is the case with femoral thrombosis.

ARCHIBALD L. McDONALD.

PEDIATRICS

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HEMORRHAGIC TENDENCY AS A FREQUENT CAUSE OF CRANIAL HEMORRHAGE OF THE NEW-BORN: John A. Foote, (Am. Jour. of Dis. of Child., July, 1920). An important factor in intracranial hemorrhage occurring during, or soon after birth, is the so-called hemorrhagic tendency of the new-born, frequently expressed in hemorrhages from the mucous membrane from various portions of the body. These cases may have convulsions, vomiting of blood, and hemorrhages from the rectum; we usually get a fatal result, unless proper remedies

are used at once. The free use of lumbar puncture and of human blood serum, horse serum or thromboplastin is recommended in every instance not only where there are external signs but also where intracranial hemorrhage is suspected. The author is frequently convinced that all of the cases are not maternal but that many cases occur after rapid delivery in which the cause lies not with the mother but with the child. Many of the cases which do not show rupture in the meningeal artery are not frank hemorrhages so much as an oozing of the vessels of the pia, not producing the classical symptoms so early as hemorrhage from the meningeal artery. There is no doubt that great relief can be obtained by lowering intracranial pressure through lumbar puncture. It is also of great value from the diagnostic standpoint.

In infants which showed within twelve to twenty-four hours after birth respiratory distress and blueness, with or without muscular rigidity and twitching, lumbar puncture was performed. In these cases where lumbar puncture was done the fluid showed blood varying from a deep to a light claret color and occasionally small clots.

In the treatment of these cases ten c. c. of serum was injected at a time underneath the skin. The results were very satisfactory. In a series of seven cases only one case died.

The surgical treatment of this condition is one which yields brilliant results when pressure symptoms allow a focal diagnosis. However, early recognition of the condition and treatment directed towards increasing the blood coagulability will be beneficial in a large number of cases where hemorrhage comes from very small vassels even as a preliminary towards surgical decompression when that is found necessary.

Roy N. Andrews.

ALLERGY IN INFANTS AND CHILDREN: Oscar M. Schloss, (Am. Jour. of Dis. of Child., 1920, Vol. 19, P. 433-454.) In this paper, based on a thorough study of a large number of sick children, Schloss points out amongst other things that in a sensitive individual cutaneous tests may be negative because of temporary desensitization. He dicusses the production and duration of this desensitization and states that one must not rely on one negative skin reaction to a suspected protein.

In some children gastro-intestinal disturbances can be proven to be due to certain proteins and yet the child may always give negative cutaneous reactions to the incriminated proteins.

This paper is a very valuable one and justice to it cannot be done in a short review.

Rood Taylor.

INTUSSUSCEPTION: Alfred A. Strauss, (Surg. Clin. of Chicago, June, 1920). The suddenness of the onset is quite characteristic of this condition. The pain is paroxysmal at first. Its location varies with the seat of the intussusception. Symptoms may appear while the patient is at rest, in motion, during feeding, or when asleep. The pain is usually followed shortly by vomiting. These two symptoms, pain and vomiting, may be considered to be a constant occurrence in young children. At this time the child usually has one or two bowel movements, they are diarrheal in character, later, though not invariably, bloody mucous or even pure blood may be passed. At this time or even earlier there is a marked prostration which may be followed with collapse. The pulse becomes small and rapid. Vomiting later on becomes fecal in character. A rise of temperature in the early stages is rarely observed, and some cases may show advanced degrees of meteorism.

The tumor of an intususception is a most important physical sign from a diagnostic standpoint. It can usually be felt per rectum, providing it is located in the cecal or in the sigmoid region. By far the largest number of intussusceptions are in the upper right quadrant, and therefore it would be physically impossible to feel a mass by rectal examination. The fluroscopic examination is quite important where it can be obtained and the condition of the child watched. This is accomplished by giving the child a bismuth enema and have an immediate fluroscopic examination made. This gives you a definite diagnosis and also the exact location of the obstruction which is of great advantage in the operative treatment.

A small rubber catheter No. 9 is usually used instead of the regular rectal tube. The enema can is held up just high enough to allow the bismuth to flow slowly along the colon up to the point of obstruction. When we notice a point of obstruction we make gentle pressure upon the abdomen at this point to see if we can force the bismuth further along the colon. By doing this we get a typical concave shadow if obstruction is present. If no intussusception is present, the bismuth will flow along the colon and will also pass through the ileocecal valve in the normal way.

This not only gives you a means of diagnosing intussusception in the colon but also in the lowest portion of the ileum. The most important factors in causing intussusception are: First: The unusually large caliber of the colon and cecum in comparison to the small ileum. Second: The ileocecal valve with the loose and free swinging cecum and ileum allows the ileum to swing in a straight line with the cecum and ascending colon producing a prolapse of the ileum into the cecum. Third: The abnormal tonic contraction of the ileum and cecum during this developmental period.

Roy N. Andrews.

ROENTGENOLOGY

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CERVICAL RIBS: James A. Honeij. (Surg. Gyn. and Ob., May, 1920.) Honeij states that a review of the literature of cervical ribs present much contradictory evidence. The symptoms usually associated with the condition are the following (Keen's classification): (1) Local symptoms; tumor, pain on pressure, bruit, etc.; (2) nervous symptoms; (3) vascular symptoms: pulsation, ischaemia, gangrene, oedema, thrombosis, aneurysm; (4) muscular symptoms: wasting, loss of power, easily tired, etc., dysphagia, scoliosis.

Among a group of nine cases presented by the author showing true cervical ribs on x-ray evidence a positive diagnosis was made from symptoms in but one, though five more gave some reference to the cervical region.

Among twelve cases of rudimentary cervical ribs the diagnosis was suspected in two. Among 19 cases suspected of having cervical ribs from the symptoms the x-ray evidence was negative in all. The aetiology of the condition from an embryological and developmental standpoint is discussed, and an extensive bibliography is given. A. U. DESJARDINS.

COMPRESSION FRACTURES OF THE LOWER END OF THE RADIUS: James H. Stevens, (Annals of Surgery, May, 1920). This article is a discussion of the mechanics and treatment of those fractures of the lower end of the radius which have been called Colles for so many years, and which Stevens contends should be called compression fractures of the lower end of the radius.

He presents a long discussion of the experimental and theoretical application of engineering principles to this fracture of the radius to show that the bone breaks in compression and not in tension, primarily, and that if this be so, we get an entirely different kind of break as regards the fibre structure, a compression break on the posterior side of the bone, first above the wrist joint, always at or near the same point, and a tension continuation across to the anterior surface. It does not fissure behind, it may or may not fissure in front. There is actual disintegration and loss of substance of the bone.

Stevens maintains that there is no impaction in any Colles fracture, since by impaction we mean telescoping, and that would mean rigidity in all cases showing this type of deformity. Instead there is actual disintegration and loss of substance. The bony substance has been crushed, disintegrated more or less, and there is nothing to impact. Take the x-rays of bad cases after reduction and you will see that what the x-ray men and the surgeons call impaction still remains, but you will know, since the fragments move easily, there can certainly be no impaction.

Stevens classifies fractures of the lower end of the radius into three groups. First, simple transverse fracture of the bone with little or no evidence of compression. Second, fracture of the lower end of the radius with evidence of great compressive force. Third, Fractures of the lower end of the radius with displacement of the distal fragment backward and sometimes in abduction. The break of the ulnar styloid is simply a sheering fracture. The ulnar fracture higher up is simply a transverse tension break secondary to the main break in the radius.

In reduction of the fracture Stevens lays greatest stress on the restoration of the normal, lateral and antero-posterior angles or planes of the articular surface.

SUMMARY:—First, fractures of the lower end of the radius are always compression fractures, the compressive side breaking first, literally collapsing. The first point of fracture is the point of greatest compression upon the cortical surface of the bone because the stress increases both in compress and tension the further away from the neutral axis. Second: It breaks in compression because the compression is much greater than the tension. Green bone reacts to strain like wet timber. It breaks at the lower end of the radius because there are several forces, and the resultant is on the lower end of the radius posteriorly. This is due to direct compression from above, the hammer blow from below, the resistance both to compression and to blow being not in the center of gravity, but eccentric to it, and, therefore increasing the strain. It is also due in part to the velocity of stress and the molecular inertia of material. Three: These compressive fractures of the lower end of the radius show the evidence of compression. There is actual loss of substance, but no impaction. Breaking up the impaction (so-called) cannot restore the planes of the articulation, nor does it do so.

It might be possible by traction over a long period of time to separate this crushed surface and permit its being filled in by new bone, thus restoring the planes of articulation, but to do this would be to sacrifice some of our chances of securing a freely movable wrist joint. Four: Early reduction followed by early passive and active motion will return all or nearly all compressive fractures of the radius to useful light occupation within twenty days. Any retentive apparatus other than the wrist strap after ten to twelve days contraindicated except in very rare instances. R. G. ALLISON.

CHEST EXAMINATION IN CASES REFERRED FOR GASTRO-INTESTINAL X-RAY EXAMINATION: T. A. Groover & A. C. Christie, (Am. Jour. Roent., Nov., 1919). Report on chest examinations

which were done routinely in 1300 cases referred for X-ray examination of the gastro-intestinal tract. In 807 of the cases both stereo-plates and flouroscope were used while a flouroscopic examination alone was done in 304 and no chest examination was made in 189. Lung lesions were found in 98 cases and of these 84 were tuberculosis. The tuberculous cases, therefore, total 6½ per cent of the total number examined or more than 7½ per cent of the cases in which the chest was examined. In only 6 cases was a lesion found in both the chest and stomach. In practically all the cases the gastro-intestinal symptoms predominated and were merely the local expression of a tuberculous toxemia. Most of the tuberculous cases were of a chronic, slowly progressive type with extensive fibrosis. A few early tuberculous lesions were discovered but these were rare. It is interesting to note that pulmonary tuberculosis occurred with the same frequency as duodenal ulcer in this series of cases.

R. G. Allison.

PATHOLOGICAL FINDINGS IN ONE THOUSAND ROENTGEN RAY EXAMINATIONS OF THE DIGESTIVE TRACT: W. Warner Watkins, (Amer. Jour. Roent., May, 1920). This report of 1,000 roentgen ray examinations has a three-fold object: To tabulate the findings in patients coming to the general pratitioner with chronic symptoms referred to the digestive tract; to illustrate the importance of thorough gastrointestinal x-ray examinations, no matter how definite the symptoms may appear; to demonstrate the frequency of certain lesions and of combined lesions of the digestive tract.

All the cases came with definite symptoms in the digestive tract or with evidence that gastrointestinal diseases were present. Four hundred came without a history or any information as to the character of the symptoms; 270 with symptoms pointing to stomach or duodenal lesions; 155 with symptoms suggesting gall bladder disease; 140 with symptoms suggesting appendix disease; and 35 with symptoms suggesting lesions of the colon.

Tables are presented analyzing in detail the x-ray findings in these cases and comparing the x-ray and clinical diagnosis. The x-ray examination was negative in 240 of 1,000 patients. These were attributed to one of three reasons: (A) A failure on the part of the clinician to have a complete examination; (B) Reflex symptoms in the digestic tract caused by lesions elsewhere; (C) Failure to demonstrate the lesion present.

Three hundred and twenty-three cases showed pathological appendices. This series gave 183 patients with chronic gall bladder disease. Duodenal ulcer was found in 124 patients. Stomach ulcer was demonstrated in 93 cases. Cancer of the stomach was found in 36 patients. Adhesions of the colon were found in 50 cases. Tuberculous colitis was found in 24 patients. Stomach syphilis was diagnosed 5 times, 2 of these being congenital in infants. Two additional cases diagnosed as cancer proved to be syphilis. Pyloric stenosis was found twice and three infants showed spasm without stenosis. Diverticuli of the colon was diagnosed 9 times and duodenal diverticuli 4 times. Ninty-five patients showed 2 distinct lesions and nine had triple lesions.

A table is also presented showing in parallel columns the x-ray and operative findings in 146 cases. Of the 146 cases there was disagreement in the findings in 35 cases, of which 12 cases were clearly errors of the roentgenologist in his conclusions.

R. G. Allison.

RENAL CALCULUS WITH NEGATIVE X-RAY FINDINGS: A. Hyman, (Boston Med. and Surg. Jour., July 15, 1920). Presents five cases of renal stone with negative x-ray findings which were observed on the surgical service of Mt. Sinai Hospital during several months.

Case 1. A patient admitted with urinary retention, due to an impacted stone in the urethra; urinary extravasation caused by attempts at removing same. X-ray of kidneys and ureter negative for stone. Patient uraemic, exitus. Findings:—Atrophied right kidney with large branching calculus (latent kidney stone), multiple left renal calculi. Chief ingredient of stones, urates.

Case 2. A patient with anuria, spontaneously relieved. Second attack of anuria; operation; death. Numerous calculi found in both kidneys, also along coudse of right ureter, although ureteral catheter was passed into pelvis on this side without encountering any obstruction. Stones from both kidneys uratic. Right kidney enlarged and pyelonephritic. Negative x-ray findings on right side, positive shadow on left side.

Case 3. A patient with uraemic manifestations; negative x-rays. Bilateral diseased kidneys with calculi. Latent stones on the left side.

Case 4. Patient with left lumbar pain radiating to thigh, accompanied by urinary frequency. X-ray of urinary tract negative. Presence of stone confirmed by wax tipped bougie. Five days later patient passed a smooth yellowish stone the size of a large cherry pit. Analysis of the calculus showed it was composed chiefly of ammonium urates.

Case 5. A patient with dull pain in right lumbar region, non-radiating. Frequency of urination; chills and fever at onset. X-ray examination of urinary tract on two occasions negative. Presence of stone confirmed by wax tipped bougie. Operation and recovery.

He sites the figures of Cabot that renal calculi fail to show roentgenographically in from 6 per cent to 15 per cent of the cases; in ureteral stone from 15 per cent to 30 per cent; and in vesical stone more than 60 per cent of the calculi fail to cast shadows. In accounting for the failure to demonstrate stones on x-ray examination several factors must be con-

sidered. The chemical composition of the stone is one important factor, the stones composed of urates being less likely to give a shadow than those composed of phosphate and oxalates. The obesity of the patient is another factor. He considers that local conditions in the kidney which cover the calculus with inflamed kidney, pus, or fibrin, as well as condensed fat may cause the inability to demonstrate the stone.

R. G. Allison.

ROENTGENOTHERAPY OF FIBROIDS:—Beclare, (Arch. Rad. & Electroth., Vol. 24, P. 254). Beclare quotes the results obtained in 400 cases of uterine fibroids which underwent Roentgenotherapy. The average age was 45 years. In 85 per cent of the cases the tumors were of sufficient size to be easily palpated through the abdominal wall. The treatments were given at weekly intervals, two areas being treated at each sitting. In very large tumors, the abdomen was divided in several areas which in turn served as portals of entry for the rays. He uses a cone of lead glass which is opaque to the ray. Under this he interposed a thin disk of wood which served to reduce the distance between the uterus and the target of the tube.

In over half the cases a clinical cure was obtained in 13 treatments given at weekly intervals. In only 4 of the cases was it necessary to resort to surgery. The menopause was usually definitely established after a few treatments although in 12 per cent of the cases the supression of the periods was only temporary and they returned after several months or years. Further treatment in these cases invariably restored the menopause. In every case treated, not only was the growth of the tumor arrested but its size was actually diminished.

R. G. Allison.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

Medical Clinics of North America, May, 1920, W. B. Saunders Co., Philadelphia.

Surgical Clinics of Chicago, June, 1920, W. B. Saunders Co., Philadelphia.

General Introduction to Psychoanalysis, Freud, Boni & Liveright, New York, 1920.

Care and Feeding of Infants, Ramsey, J. B. Lippincott Co., Philadelphia, $2.50, 1920.

Medicine and Nursing, Oxford University Press, 1919.

Standard First Aid Manual, Johnson & Johnson, N. J.

Epidemic Encephalitis, Tilney & Howe, Paul B. Hoeber, New York, $3.50, 1920.

NERVOUS AND MENTAL DISEASES. By Archibald Church, M. D., Professor of Nervous and Mental Diseases in Northwestern University Medical School, Chicago; and Frederick Peterson, M. D., formerly Professor of Psychiatry, Columbia Univerity. Ninth edition. W. B. Saunders Company, 1919. $7.00 net.

The 9th edition of Nervous and Mental Diseases, Church and Peterson, has made its appearance. Any book, scientific or otherwise, which reaches a 9th edition, it goes without saying must have something of unusual merit in it to recommend it.

The same plan which has made the former editions of this book so successful, has been strictly adhered to in this 9th edition. As the authors themselves say, the book is written simply and solely as a text book, for the use of students and also to fulfill the needs of busy general practitioners, who from time to time desire a reliable reference in the subjects of Neurology and Psychiatry.

The entire literature of these subjects has been carefully sifted by the authors and an up-to-date digest from this sifting has been made, which, in the light of their own experience and teaching, seemed the best method of presenting them in the briefest and clearest manner.

The book is not a collaboration of both authors. The subject of Neurology is presented by Dr. Church, while that of Psychiatry is dealt with by Dr. Peterson.

That these authors have succeeded in attaining their object in presenting a text book adequately fulfilling the requirements of both students and general practitioners, the success of former editions as well as the appearance of the 9th edition is convincing proof.

C. R. Ball.

A DIABETIC MANUAL. By Elliott P. Joslin, M. D. Assistant Professor of Medicine, Harvard Medical School, etc. Second Edition, Lea & Febiger, Philadelphia and New York, 1919. $1.75.

The author states that lack of exercise, obesity, infections and heredity are important factors to be considered in the causation of diabetes. He shows in recent years the decrease of mortality from this disease and attributes it principally to the introduction of newer methods of treatment inaugurated by Allen, to the more accurate tests for the estimation of the severity of acid poisoning, to the preliminary omission of fats, to the omission of alkalies, and lastly to the reporting of diabetic patients at intervals for examination and further instructions. Then follow questions and answers for diabetic patients as well as indispensable tests, weight of food and food determination. The diabetic arithmetic consists of the metric system with a table of foods arranged approximately according to the content of carbohydrate, another showing the quantity of carbohydrate, protein, fat, and the caloric value of one ounce of foods in common use and then follows a rapid computation of a diet table. In order that the patient may get the highest efficiency out of his visit to the

doctor, a careful physical examination, urinalysis, blood chemistry and body weight is recorded. The patient being instructed to keep a note book, brings this also at his visit to the physician to enable him to draw more accurate deductions and give specific details in the treatment. Physical and mental hygiene for diabetics is strongly advised and some very interesting remarks and letters from patients are quoted. After a discussion of the diet of normal individuals in various occupations the composition of normal diet is approximately given as carbohydrate 400, fat 100, and protein 100 grams.

For small amounts of food, household measures are held to be impracticable. In commenting on the diet of diabetics, the author states that if one-fourth of the normal carbohydrate can be given, the results are gratifying. About 1.5 grams of protein per kilogram of body weight is given and the bulk of the caloric value for maintaining weight, the fats must contribute. The use of alcohol is questionable, liquids and sodium chloride is encouraged, and danger of fats to diabetics is forcibly emphasized. In the dietetic treatment of diabetics, urine should be sugar freed first by eliminating fats, then proteins from the diet and finally halving the carbohydrates until about 30 grams are given when fasting may be safely undertaken. If the patient still has sugar in the urine after 3 to 4 days, fasting, 1 gram protein or .5 gram carbohydrate per kilogram are given for a day or two and fasting again resumed. This procedure with careful observation of patient, can be repeated until urine is sugar free. After this has been accomplished, carbohydrates are given 5 to 10 grams daily until sugar appears. The patient is starved again sugar free and then brought only up to about two-thirds of his original carbohydrate tolerance when proteins are added to the diet from 15 to 20 grams daily until 1 to 1.5 grams per kilogram are being given. Then fats are freely added from 15 to 20 grams daily to the above diet according to the previous acidosis until patient is losing no weight. Diets with illustrated cases are placed here to facilitate the dietetic management of typical cases.

Acid intoxication and coma should be combated by good nursing, rest in bed, care of bowels, administration of about 1000 cc. liquids every 6 hours, and stimulants such as digitalis, coffee, caffein; alkalies should be avoided, and if patient is used to fasting, this should be instituted, otherwise fats should be omitted.

A further discussion follows, giving reasons for loss of weight during the first two weeks and the waste of food eliminated as sugar in the urine. Care of teeth, skin and daily baths avoiding extremes in temperature, are very useful. Constipation and diarrhea should be avoided and a certain amount of daily exercise is advised. The final chapters deal with dietetic suggestions, recipes, menus, diet tables and selected laboratory tests useful in the modern diabetic treatment, such as pertain to the examination of urine, blood and expired air.

It is unnecessary to state that for its kind it is one of the most useful diabetic books written in any language, both to the patient and physician, as firm co-operation and mutual understanding are indispensable for the successful treatment of this condition.

J. A. Lepak.

THE DISEASES OF INFANTS AND CHILDREN. By J. P. Crozer Griffith, M. D., Phd. W. B. Saunders & Co. $16.00.

This two volume work is profusely and beautifully illustrated. It has been the author's aim to present a review of the subject of medical pediatrics. Some subjects in surgery, and some of the special branches with which pediatricians must be familiar, are included.

Of special value are the foot notes, referring to the literature from which quotations have been made, making further research possible, and as the author says, "The foot-note method interferes in no way with its usefulness to those others who are interested in this line of research".

Numerous cross references throughout the work call attention to the discussions of the subjects on other pages, which might otherwise be overlooked. In the chapter on intestinal diseases, the author pays tribute to Finkelstein's classification, but at the same time points out its disadvantages, and gives a classification based chiefly upon clinical manifestations, modified by what we know of the respective action of the food ingredients and of the bacteria.

This work will hold its own in the growing field of pediatric literature.

G. K. Hagaman.

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ORIGINAL ARTICLES

TUBERCULOSIS OF THE KNEE JOINT IN CHILDREN*

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Tuberculosis of the joints in the order of frequency affects first the vertebral column, second the hip, and third the knee. The knee joint being superficially placed presents more objective signs than the hip or the spinal column. Tuberculosis of the knee is commonly supposed to be about evenly divided in the sexes, and a little more common on the right side than on the left. It is more often encountered in childhood and in early adult life, but is to be seen at all ages. Since the disease is further away from the trunk it is less dangerous to life than tuberculosis of the hip or of the spine. The treatment of this joint is easier than of the hip for the two long levers making up the joint permit of comparatively easy fixation, whereas in the hip joint the fixation apparatus must at least include the entire pelvis in order to provide rest for the affected joint.

ETIOLOGY AND PATHOLOGY

The disease is caused by the tuberculosis bacillus, either human or bovine. It is hematogenous in origin, always being secondary to a tuberculous focus elsewhere in the body. The usual primary focus is the lymph glands, particularly the upper deep cervical, bronchial, or mesenteric group. As a result of the caseation of these glands and a breaking down of one of the vessels, the debris with some of the tuberculosis bacilli enter the blood stream and are carried as small emboli to the right side of the heart and thence through the lungs into the systemic circulation. It is possible also that the bacilli may gain entrance to the thoracic duct and be carried through it into the general circulation.

The reason that the bacilli select the bones and joints for a habitat may be explained on anatomic grounds. The blood supply to the long bones may be divided into three systems: (1) diaphyseal, (2) metaphyseal, and (3) epiphyseal (Fig. 1). The diaphyseal system is the least concerned with the subject under discussion, but the vessels of this group run toward the epiphyseal end of the bone and anastomose with the metaphyseal vessels, the latter gaining entrance from the periosteal structures. All three systems anastomose quite freely at the metaphyseal area and, the vessels being larger, the circulation is correspondingly slower than elsewhere; therefore, any emboli of bacilli are apt to be arrested here. Fraser of Edinburgh did a large amount of experimental work on surgical conditions of bones and joints and found that it was difficult to infect bone marrow with tuberculosis, even when he injected the bacilli directly into the marrow cavity; since he knew that clinically bone tuberculosis is common he concluded that some change must first take place in the marrow in order to make the field suitable for the growth of the tuberculosis bacilli. He decided that a gelatinous degeneration in the marrow substance must first occur, and that such degeneration must be caused by the tuberculous toxemia or a hemorrhage in the bone substance. On such a medium the tuberculosis bacilli flourish. Sir Harold Stiles, for many years chief surgeon to the Royal Edinburgh Hospital for Sick Children, reminds us that comparatively mild trauma may loosen an epiphysis and he therefore believes that some of the so-called sprains may easily cause a hemorrhage in the metaphyseal area and thus provide, in the hemorrhage, a suitable field for

*Presented before the Southern Minnesota Medical Association, Fairmont, Minn., June, 1920.

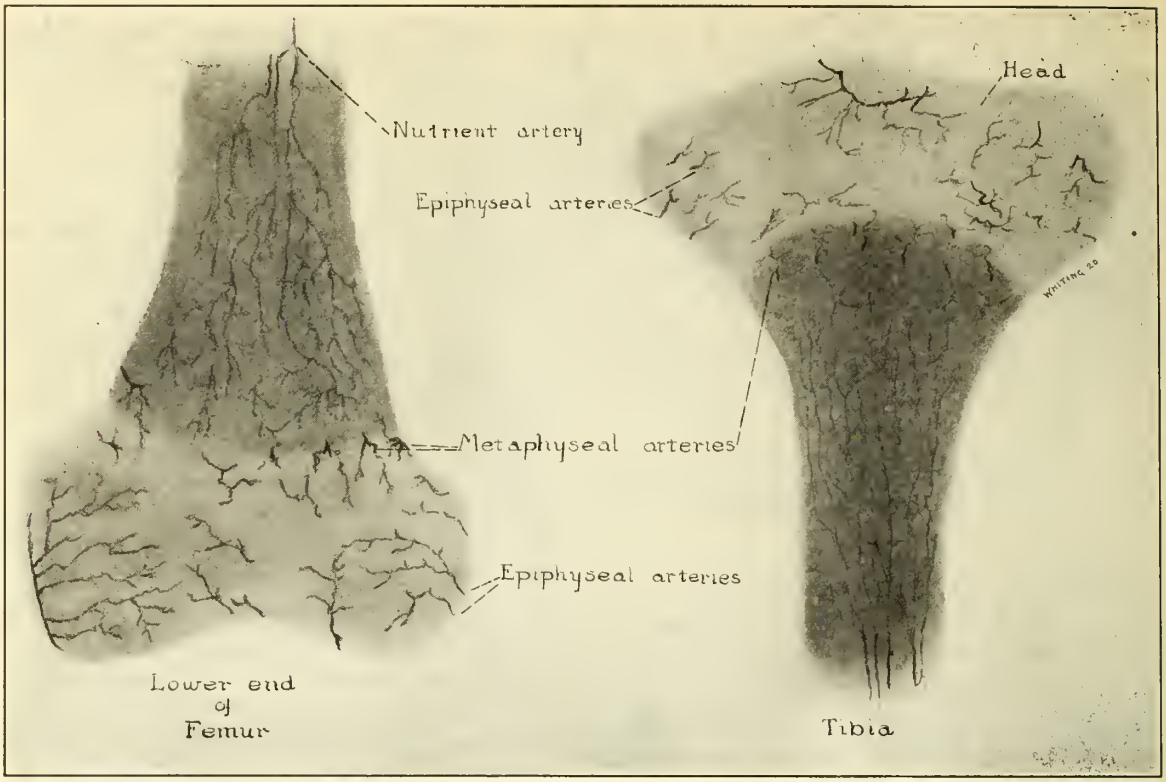

Fig. 1. Blood supply to bone ends (Lexer).

tuberculosis bacilli to be deposited by the blood stream to begin their deadly work. This may happen many more times than would seem possible and the resistance of the victim be so great that he is able to cope with the infection. It is possible that an embolus of tuberculosis bacilli may be locked up in this way during childhood, leaving an area that is a good site for the development of tuberculosis in adult life.

Just how the tuberculosis bacillus gains entrance into the human body is of great interest. It is often thought that the dried excretion and sputum in the form of dust is inhaled, thus introducing the bacillus. Lawrason Brown has recently reported some experiments in which he collected dust and dirt from hovels previously occupied by persons who had died of pulmonary tuberculosis. This material was emulsified and injected into guinea pigs intraperitoneally with negative results. It was only by practically taking the material from the lips of patients with open pulmonary tuberculosis that he was able to produce positive results in guinea pigs. Such experiments seem to indicate that we have over-estimated the danger of infection by dried bacilli, but this should in no way permit of fewer precautions. From clinical experience, we well know the danger from contact and intimate associations.

In 1901, when Koch read his paper at the International Medical Congress in London, he made some statements that show how far from the truth even so great a man as he can stray when he states as facts what are in reality merely impressions. He stated that, "the bacillus of human tuberculosis is incapable of producing tuberculosis in the bovines" and "the bacillus of bovine tuberculosis is to be considered as practically incapable of transmission to man and that consequently the danger of contracting phthisis from the milk or meat of tuberculous bovines need no longer be guarded against". This brought forth much criticism and the question remained open until the work of Stiles and Fraser proved the error of Koch's statement. These observers had under their care many cases of surgical tuberculosis in children in the Royal Edinburgh Hospital for Sick Children and when a patient with tubercu-

losis was brought to the hospital, the home of the patient was visited to investigate the living conditions, and to determine whether any members of the household or family were or had been suffering from tuberculosis in any form. The food was looked into and it was not long before the investigators were convinced that the milk supply, at any rate in the vicinity of Edinburgh, was a great medium for conveying bovine tuberculosis bacilli. Miller and Mitchell concluded that from 16 per cent to 20 per cent of the Edinburgh milk was infected with tuberculosis bacilli.

Fraser very carefully examined the material obtained from the cases of surgical tuberculosis and determined whether it was due to the human or bovine type. He proved by various laboratory tests that 62 per cent of a series of cases of proved bone and joint tuberculosis owed their origin to the bovine type of bacillus. Seventy-one per cent of the 38 per cent said to be due to the human type presented a history of tuberculosis, usually pulmonary, existing or having existed in some member of the family with whom the patient had been intimately associated. Fraser found while carrying on these experiments that it was easy to produce synovial tuberculosis in animals by introducing bacilli into the blood stream. Stiles believes that the infection is apt to be in the synovia more commonly in the knee than in any of the other joints. Trauma, as shown by this experimental work, at least as far as the bones are concerned, plays a prominent part in the production of tuberculosis; these observers agreed that a comparatively slight injury to the metaphyseal area may cause a slight hemorrhage and thus provide the field for growth to the bacillus.

DaCosta says, "To deny the possibility of traumatic tuberculosis is to deny many of the truths of pathology and some of the plainest lessons of clinical medicine." As far back as 1880, Max Schuller injected tuberculosis bacilli into the trachea of dogs and at the same time injured the right knee. Some of the animals developed a general tuberculosis and some a condition that appeared histologically to be a tuberculosis of the right knee. The knee that was not subjected to trauma was not affected in any case. Koenig maintained that trauma was

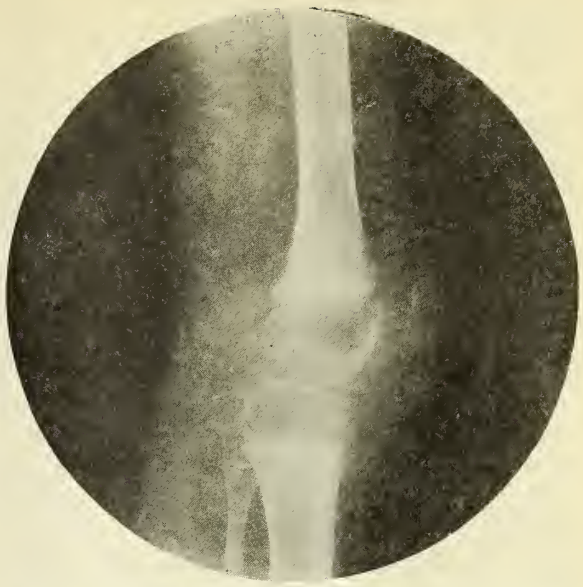

Fig. 2. Girl aged 5. Six months' history. Disease apparently primary in patella.

the causal influence in one half the cases of tuberculous joints.

As shown by the anatomic work of Lexer, the synovial vessels, the metaphyseal vessels, and the diaphyseal vessels freely anastomose. Stiles states that there is no reason why both synovial and metaphyseal tuberculosis should not exist at the same time and that consequently there is no reason why one should not be secondary to the other.

While from the viewpoint of treatment there is a great difference between tuberculosis of the knee joint in the adult and the like condition in the child, the same is not true of the pathology. Although the pathologic picture is apparently different, the difference is readily explained by the fact that there is a preponderance of cartilage in the knee joint of the child. It is generally conceded that tuberculosis rarely, if ever, develops in cartilage. How then can we explain the common occurrence of the disease in childhood? In the first place, milk is a more common article of diet for the child than for the adult; second, trauma of the joint and possibly injury to the epiphyseal (metaphyseal) line is more common; third, children are more susceptible to all forms of infections, the immunity they possess being hereditary and not acquired, and fourth, the infection may often be primary in the synovia, gaining entrance through synovial vessels. It is not ex-

tremely rare to meet with the disease primarily in the patella (Fig. 2).

SYMPTOMS

The train of symptoms is more or less definite and if there is any symptom of more importance than others it is the presistency of the complaint (Fig. 3). There are remissions but no intervals of complete freedom. Often a history of trauma is elicited definitely preceding the onset of symptoms. A limp worse in the morning due to stiffness may be noted by the parents even before the child complains. Pain, although generally mild, may be severe; in the latter case the onset is acute, simulating an acute infection. The suffering in such instances is extreme. Pain is a much less prominent symptom than in tuberculosis of the hip joint. Also, since the knee joint is a simple hinge joint, the mechanism back of the deformity produced is much simpler than that in the hip joint. The joint is superficially placed and the changes in the capsule of the joint are not hidden by muscular structures. The swelling produced by the effusion within the cavity and the inflammatory thickening of the capsule are at once evident. Local heat can be detected on palpation but redness is only present when secondary infection supervenes, hence, the name "white swelling".

Flexion is the primary deformity but as the disease progresses, the secondary deformities of external rotation with consequent knock-knee and subluxation develop (Fig. 4). Flexion advances rapidly due to the fact that once it is present the hamstrings have a great advantage over the extensors. The biceps femoris through its insertion into the head of the fibula tends to flex and rotate outward and abduct the tibia, producing knock-knee. As the flexors gain the advantage, they tend to pull directly back on the tibia as it is flexed and produce a subluxation, a most troublesome deformity with which to deal. Atrophy of the thigh and calf muscles ensues and it appears to be more than the mere atrophy of disuse. Asssociated with this is atrophy of the bone, which shows

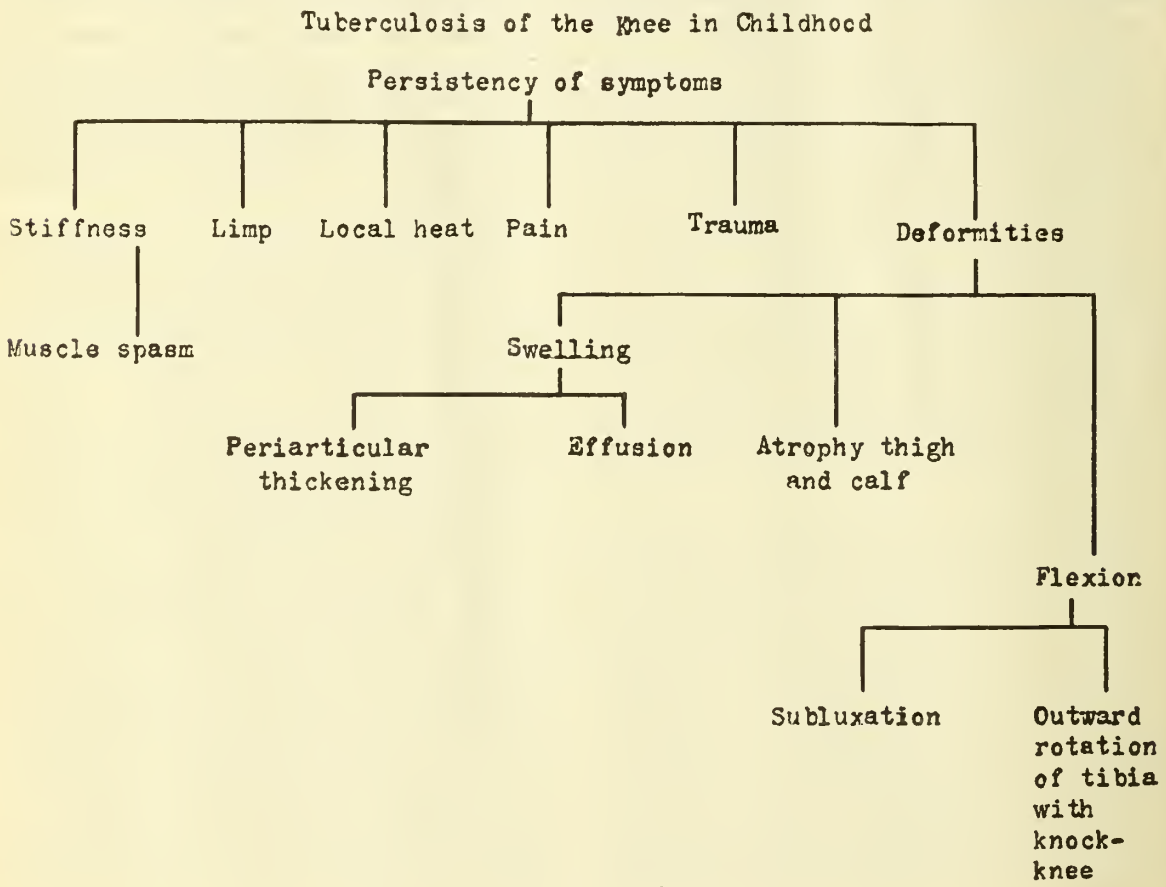

Fig. 3. Chart showing prominent symptoms.

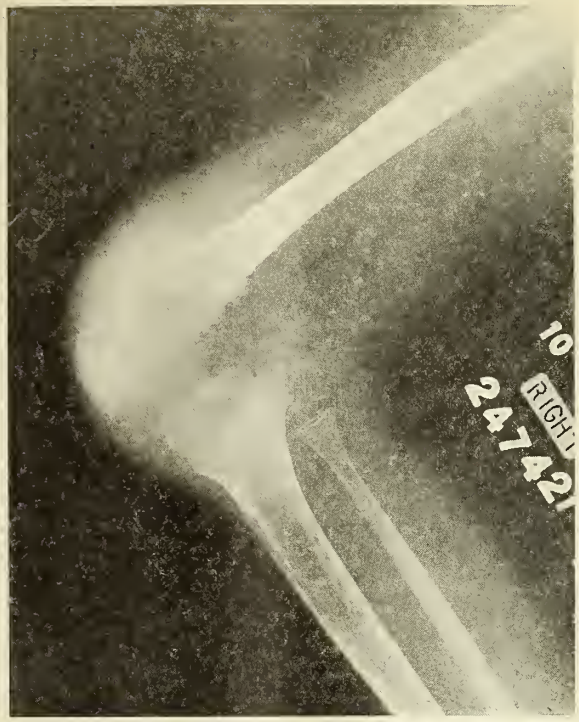

Fig. 4. Girl aged 6. Injury at two years. Very little complaint for three years except limp. Exacerbation last year with development of flexion and subluxation.

up as an osteoporosis in the roentgenogram. Fever of one or two degrees is generally present but may be due to many other causes, especially in children; it should not, therefore, be taken too seriously. The von Pirquet test is of value, especially in young children, and should be used as an aid but should not be relied on to the exclusion of other means of diagnosis. The roentgen ray should always be employed but the picture in the early stages is not very definite; so much cartilage is present that the amount of destruction may be minimized in the plate (Fig. 4). The area near the epiphyseal lines in both the tibia and the femur should be closely scanned to determine whether or not there is a bony abscess which might be drained extra-articularly. Joint symptoms of a mild nature almost premonitory in character may be produced by these metaphyseal abscesses. The roentgen ray is of less aid in diagnosing tuberculosis of the knee in children than it is in the adult. If more than one joint is involved extreme caution should be used in diagnosing tuberculosis. The patient may be and generally is in good general physical condition. The family history is important. Fraser, as I have stated, showed that in 70 per cent of the cases due to the human bacillus, a positive family history was elicited. Aspiration and intraperitoneal injection of the fluid or debris in a guinea pig is a very valuable test and should be used when practical. The occurrence of tuberculous glands of the neck, tuberculous peritonitis, or tuberculous involvement elsewhere naturally is evidence in favor of tuberculosis in the affected knee. Pulmonary tuberculosis is rare in children but when present is of serious moment.

DIFFERENTIAL DIAGNOSIS

Syphilis may simulate tuberculosis of the knee joint and not infrequently causes effusion in the knee but it is apt to be present in both knees. Careful questioning may bring out the fact that syphilis is or has been present in one or both of the parents. The child, and the parents in suspected cases, should have a Wassermann test although a negative test, if the clinical signs point more to syphilis than to tuberculosis, should not be accepted as final. Iritis and Hutchinson's teeth may throw the balance in favor of syphilis in an obscure case and should always be looked for.

An arthritis due to an ordinary infectious cause is usually more acute and rapid in its course. The more chronic form of infectious arthritis, in reality an arthritis deformans first described by Still and hence called Still's disease, may be confusing, but in such cases other joints soon show involvement and the patients are usually in a poor general condition (Fig. 5). General glandular enlargement and an enlarged spleen are common findings in Still's disease and are absent in tuberculosis of the joints.

Sarcoma of the lower end of the femur or upper end of the tibia produces joint symptoms, but on careful examination the enlargement will be noted in one or the other of these bones. A roentgenogram will definitely show the lesion and for this reason, if for no other, it should always be made in all affections of the joints or bones.

TREATMENT

The treatment may be roughly divided into general and local (Fig. 6). The fact should never be lost sight of that the disease being treated is tuberculosis and every means possible

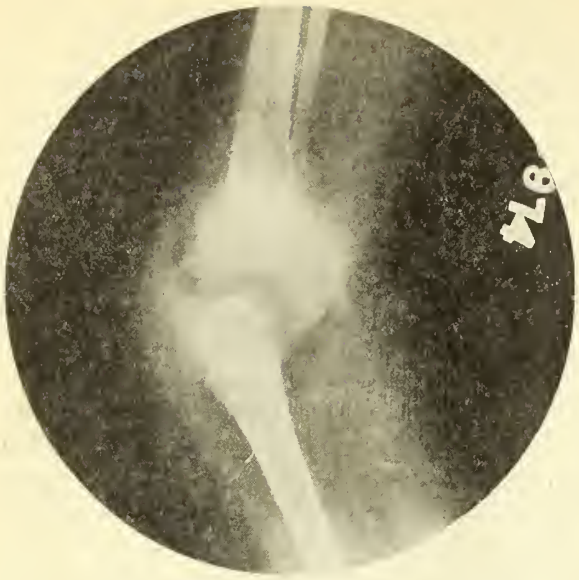

Fig. 5 Infant, aged 20 months. Arthritis deformans. Roentgenogram shows synovial thickening. Indefinite diagnosis until year later when other joints became involved.

should be used to raise the patient's general resistance. Open air, sunshine, tonics, nourishing food, and congenial and at the same time sensible surroundings, should be insisted on. In several instances I have seen children, who in spite of all our efforts were in a steadily downward course, change to a steadily upward course on merely having their companions changed and sensible amusements substituted for those causing nervous strain. Tuberculous children are often precocious and may read books in too great numbers and fit only for mature minds. It may be necessary to take a firm hand and dismiss a fond parent as an attendant and substitute a less interested and more phlegmatic person. The best of local treatment may be of no avail if the general treatment is not carefully supervised.

The keynote to local treatment is conservatism. If treatment is instituted early and the proper means are taken to prevent the development of deformities, the management is easy. The patient coming late with subluxation and knock-knee and external rotation of the tibia is, on the other hand, most difficult to treat. A properly applied plaster of Paris cast affords excellent fixation (Fig. 7A and B). The ordinary stiff legged brace, in mild cases, is often sufficient. In the more acute cases rest in bed with extension may be necessary and when the patient is allowed to be up a plaster of Paris cast is indicated, with a high soled shoe on the opposite foot and crutches to prevent weight bearing. The Thomas extension splint (Fig. 8 A) is excellent, but unless guarded against is especially prone to cause a relaxed knee joint. As the condition improves, a walking caliper Thomas splint may be used (Fig. 8 B). All apparatus must be carefully supervised and care taken once the flexion is overcome to prevent genu-recurvatum. When subluxation is present more elabo-

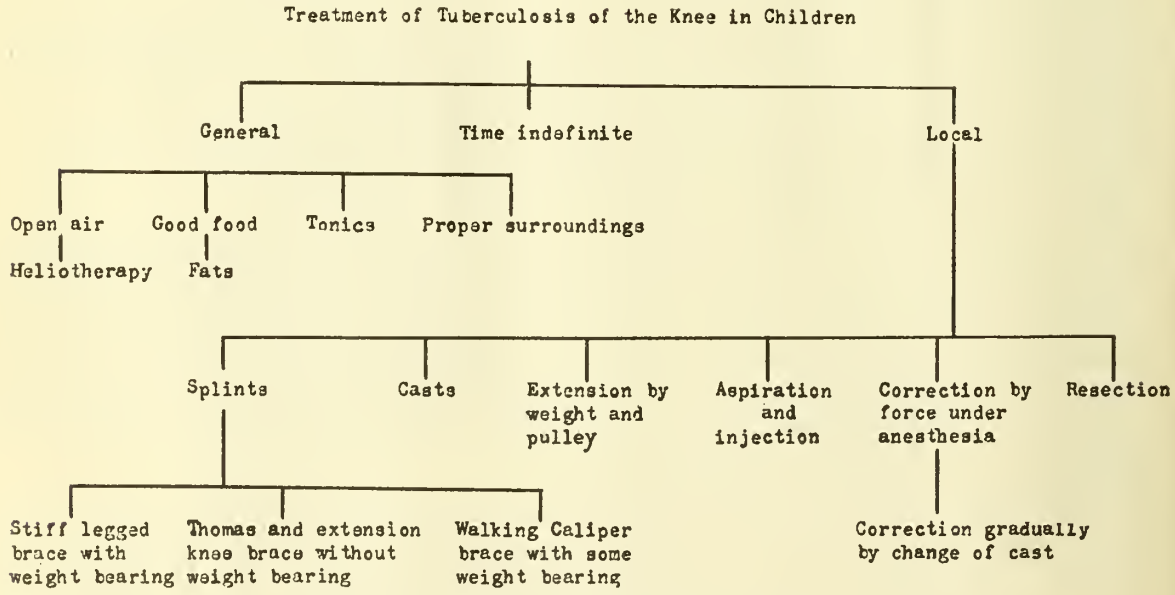

Fig. 6. Chart showing essentials of treatment.

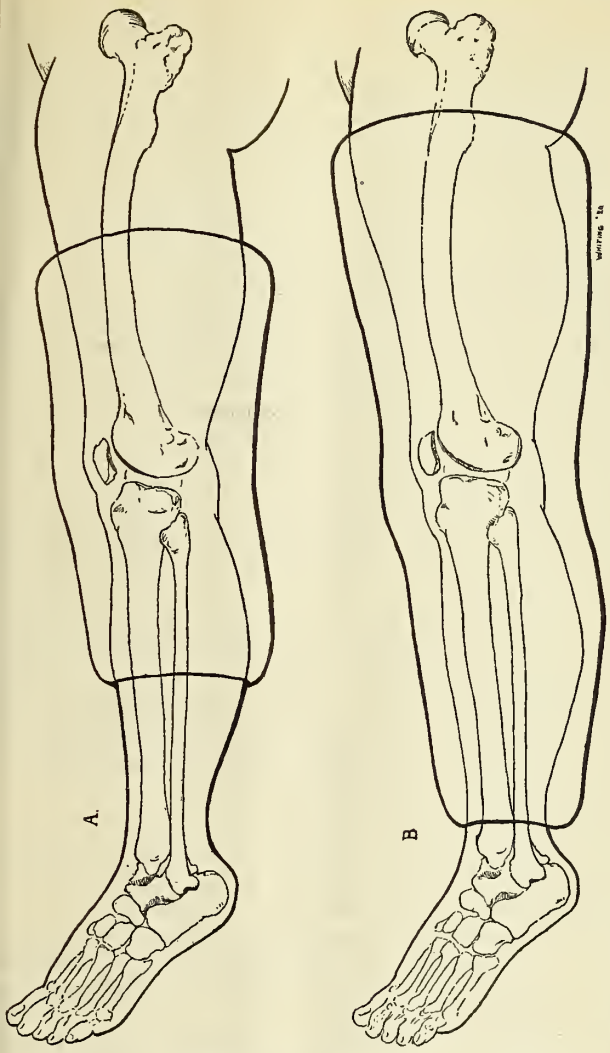

Fig. 7. A. Outline showing short cast giving poor fixation.
B. Long cast giving good fixation.

rate measures are necessary. Prolonged traction with weight and pulley, with the line of pull carefully directed, may straighten the knee. So many hindrances may be put in the way of this method, such as little tricks of the patient to lessen the pull, and kind-hearted but really meddlesome relatives and attendants who lift up the weights to ease the patient, that it may be better to give the patient a light anesthetic and gently force the knee straight. At the first indication of a tendency to further subluxation, the force should be stopped and a cast applied with the flexion deformity only partially corrected. This may be repeated and usually the knee can be brought straight in three or four attempts. The knee must never be moved back and forth, but merely forced straight to the point where it seems safe. Not infrequently the knee can be brought down without the use of an anesthetic by merely applying a cast and at the end of a week or ten days removing it; at this time it will be found possible to obtain a few degrees more of extension, in which position a new cast is put on and the process is repeated until the knee is straight. This method always takes more time than when an anesthetic is used, and may be very slow and in some cases impossible.

Aspiration of the joint and injection with some antiseptic solution such as formalin in glycerin or iodoform in glycerin is ordinarily looked on with disfavor. In certain cases in which the effusion is extensive and the bony involvement apparently nil it may well be used. This should not be carried out with disregard to the proper mechanical measures to prevent deformity, but should be used only in conjunction with them.

It has never been our custom in the Mayo Clinic to resect tuberculous knees in children. Stiles has reported a large series of resections and the results have been astonishingly good. In America, however, we have not thought it necessary to resort to surgery. The type of tuberculous knee that is seen in the children in the Edinburgh clinic is more malignant than is seen in this country, and there seem to be very good grounds for the radical measures.

When the patient comes late in the disease with probable multiple draining sinuses the prognosis is poor. Fixation must be provided. Surgery only serves to spread the trouble unless there is a definite sequestrum. Heliotherapy, with general measures, offers the most. Under proper instruction, the child should be exposed to the sun's rays until the whole body is thoroughly tanned, care being taken not to burn the skin.

Tuberculin is used by some but there is considerable controversy over its value. Its use was abandoned some time ago in the Mayo Clinic as we could see no benefit from it.

The prognosis is reasonably good, especially if the treatment is started early and general and local measures are well and properly carried out. The question always asked by the parents is how long the treatment is to last. This can be answered only indefinitely; the parents should be

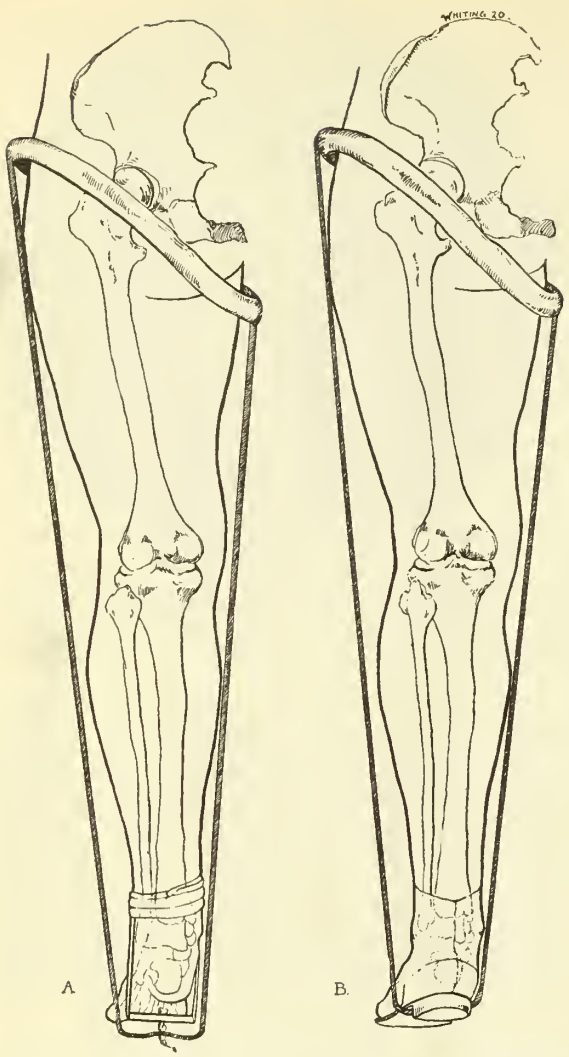

Fig. 8. A. Thomas extension knee splint showing ring resting on tuberosity of the ischium, thus giving a fixed point for extension.

B. Thomas walking caliper split with the irons fastened in the shoe and the heel just short of contact in the shoe.

told frankly that the treatment will mean years of observation and that a eure may mean a stiff knee, athough many patients recover with considerable motion and a few with practieally full motion. A proper understanding with the parents at the start will seeure their confidence and understanding.

RESUME

1. Tubereulosis of the knee is always secondary to a foeus elsewhere in the body and may be caused either by the human or bovine tuberculosis bacillus.

2. Trauma is a prominent etiologic factor.

3. The disease may be either primary in the synovia or in the bone. It is difficult to determine whieh is the more eommon. It is the impression of the author from clinieal experience that the synovial type is fully as common in children as the osteal type.

4. The symptoms are usually mild and the deformity develops surreptitiously with but little eomplaint from the child.

5. The treatment is essentially conservative, and if instituted early, earefully planned, and carried to eompletion affords a good prognosis.

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DISCUSSION

DR. EMIL S. GEIST, Minneapolis: I wish to congratulate Dr. Henderson on his paper because it fulfills the requirements just as a modern woman's dress does, in that it was short enough to be interesting and long enough to cover the subject. (Laughter.)

When I see a patient afflicted with tuberculosis of the knee or other forms of joint tuberculosis, I ask why? We know there are two ways of infecting children, either by means of some patient who has an open tuberculosis, or from inadequate supervision of the milk supply. Every case of joint tuberculosis in a child is really unnecessary and means that in some way or another a mistake has been made in the surroundings of the child or on part of the health authorities.

I am sorry Dr. Henderson did not mention the differential diagnosis of tuberculosis of the hip joint.

A case comes in with a beautiful cast on the knee while the disease started in the hip joint. The thigh being atrophic makes the knee look larger and swollen. It is not an uncommon thing to have this happen and it is rather difficult to explain why that cast is on the knee and not on the hip. The first picture he showed of blood vessels in the knee joint explains that.

Another reason why these children should have tuberculosis of the knee more often than adults is because there are more blood vessels growing in the knee joint of the child than in the adult. Lexer's studies show very nicely how the number of blood vessels in the adult knee joint is much less than in the knee joint of the child. Of course, the more blood vessels, the more bifurcations, the more chance there is for embolus and all that sort of thing.

Conservative treatment is the thing in tuberculosis of the knee joint in children; at the same time, operative treatment must sometimes be resorted to.

Regarding resection, I happened to have in Paris about ten years ago immediately following an epidemic of resections of knee joints. In other words, children at the age of eight or twelve had their knee joints resected, and I saw those cases twenty-two and twenty-four years of age with their legs eight or ten inches shorter than on the other side. Resection involves the epiphysis. The active growing centers of the leg are situated about the knee joint, and resection is an operative procedure which, if done at all, must be done with the idea of conserving the epiphyseal cartilage. If an operation is to be done, I think the new operation of Dr. Hibbs, of New York, whereby he fixes the knee by using the patella as a graft, taking out the patella, making a place for it between the tibia and femur, and embedding the graft in there, making a bony bridge across from the femur to the tibia, and not involving the epiphysis should be done. This can be done in children who are ten or twelve years of age who have the very virulent type of tuberculosis that Dr. Henderson mentioned. Dr. Hibbs told me a few weeks ago he was doing that operation on this class of cases and has seen no reason to regret it. Operative treatment in tuberculosis of the knee in children will occupy a rather small but definite place in surgery.

A STUDY OF CHEST CONDITIONS ASSOCIATED WITH AORTIC DISEASES, SPECIFIC AND NON-SPECIFIC*

By E. L. Tuohy, B. A., M. D., F. A. C. P.
Duluth, Minn.

This paper will deal with an analysis of a group of cases classified primarily as aortic aneurysm, aortic aneurysm with aortic insufficiency, syphilitic aortic insufficiency, syphilitic mesaortitis, rheumatic endocarditis with aortic insufficiency, angina pectoris, and miscellaneous mediastinal conditions simulating aortic disease.

We will find that as far as etiology is known we will deal chiefly with the results of (a) Syphilis, (b) Streptococcus or Rheumatic Infection, (c) Chronic Degenerative Vascular and Myocardial Changes. Statistical data will be given on the two latter groups, chiefly to accentuate and compare them with the first, which is virtually the chief subject of this compilation.

In those conditions known to be due to syphilis, or in which we can prove it to be the cause, the absolute advantage and need of an early diagnosis is beyond cavil. On the other hand, a word of caution is needed not to overwork it in assigning it as the cause particularly in the groups classified above as (c). Our statistics of true major angina, for example, will not confirm the often expressed relationship to syphilis; they fall in a later decade of life, and occur with a different pathologico-anatomical complex. Our possession of incomparable therapeutic weapons to overcome the destructive propensities of the spirocheta pallida is only equaled by the amazing faculty of this organism to insinuate itself and devise its own protection. An apparently simple and evanescent "soft sore" at twenty can be the true source of aortic aneurysm at seventy.

Nothing exemplifies better our changing standards than an historical survey of syphilitic aortic disease. The principle is not confined to any special field in Medicine, as witness the means now at our disposal to identify duodenal ulcer. Compare our present knowledge of the incidence and importance of that condition with

*Read before the Minnesota Academy of Medicine, May, 1920.

the teachings and practice of a scant twenty years ago. In changing from period to period, courage and conviction are necessary to cast off any of the traditions of the past, for fear lest in the mass of straw a few precious kernels of wheat might be concealed. Hence we have our massive and unwieldy text books and medical systems; the best excuse extant for our ever increasing periodical literature.

THE INFLUENCE OF ROENTGEN-RAY AND SEROLOGICAL STUDY

The development of the X-ray and perfection of the fluoroscope, together with the Wassermann blood test, have done for the study of syphilitic ortitis what many specific tests previously have done for other diseases: they have put into the background the elucidation of a great mass of less definite data. The distinct loss arising from the failure of younger clinicians to train their faculties and perceptions in the older lines of "physical diagnosis" is at least in part overbalanced by the enormous advantage accuring to the patient, through earlier and more accurate diagnosis. The tendency, however, is not without its critics. Hoover[1] has recently challenged an editorial in the A. M. A.[2] which stated briefly, that aside from early Roentgen signs and serum findings, early specific aortitis awaited a reliable means of identification. Even accepting Hoover's proposition at its face value, and acknowledging all the claims, we only need refer back to his statement that "The older established methods of bringing out physical signs serve equally well as the newer diagnostic criteria". We are confronted then, with the conclusion that the skill needed in the interpretation of the signs he mentions depends so greatly on personal factors, the cultivation of particular senses in the examiner, as to render decisions by those less skilled liable to error and faulty judgment. In other words, while instrumental data and laboratory technique may lead us away from intensive individual development, they are fortunately subject to standardization and therefore to a wider and more universal usefulness. We may state unequivocally that the Roentgen-ray is indispensable in modern chest diagnosis, and it is fit and proper that the clinician should know fully its possibilities and its limitations.

The laboratory tests for syphilis no longer need defenders, and in searching for the earliest evidence of syphilitic invasion of the aorta we may well heed the words of Elliott[3]: "From the practical clinical standpoint accumulating evidence is forcing the conclusion that a persistently positive Wassermann reaction in a patient without evidence of syphilis in the skin, mucous membrane or nervous system, points to the aorta as the next, most probable seat of the disease". In speaking of substernal oppression or pain in a middle aged individual, Schneider[4] — "Should be proven clinically, radiologically, serologically and therapeutically to be free of syphilis". Our own experience abundantly affirms the correctness of both of these statements. The extent with which the X-ray and properly safeguarded Wassermann tests are used, is of far more than academic interest; because the life and efficiency of a very large number of people depend upon the accuracy and intensity with which the average doctor examines the average patient. There are few disease states in which the pathology has been worked out so definitely as syphilitic aortic disease. Yet, at the two extremes—its terminal stage and its incipiency —there are few conditions more often misjudged; aortic aneurysm in its various stages masquerades as bronchitis, asthma, tuberculosis, malignancy, etc.; or, in those with beginning substernal oppression and in the curable stage are either designated a neuralgia or a neurasthenia.

Little mention was made of the use of the X-ray in diagnosis until about 1905. Babcock's book[5], published in 1903, refers to the X-ray as "useful in certain cases". Salinger's translation of Leube[6], scarcely mentions the X-ray at all. C. L. Green's diagnosis[7], published in 1907, ends the discussion strikingly by stating: "The last 20 cases of thoracic aneurysm coming under the Author's attention, have been subjected in each instance to the X-ray, and without it fully 50 per cent would have gone unrecognized". Osler himself wrote the article for "Osler's Modern Medicine"[8], published in 1909. In it he devoted 52 pages to a discussion of the general aspects of the disease, and only one brief page mentioning the possibilities of the X-ray. He had, however, the great gift of prophecy, and evidenced it by dividing his

discussion up into an analysis of (a) Aneurysm of Symptoms; (b) Aneurysm of Physical Signs. He clearly grasped the proposition that the early symptoms long antedated, as a rule, the disastrous ultimate structural change. But not until the period of 1910-1912 did the Wassermann test begin to figure prominently in statistical tables, and to furnish a connecting link between clinical histories, physical findings and post-mortem results.

THE INFLUENCE OF ALLBUTT'S BOOK

Few books have been so deservedly widely read as Clifford Allbutt's "Diseases of the Arteries, Including Angina Pectoris"[9]. This compilation is remarkable not less for its amazing wealth of references to the literature than for the opinion and observations of the author. The work has certainly not lacked reviewers, not all of whom agree with the writer; but he has not failed to impress his point: the decided influence of disease in the aortic wall in the production of that very definite something known as angina pectoris. From the standpoint of national conflicts, as evidenced even before the great war, it is of interest to read his tribute to the "Kiel" school and "Dohle-Hellersche Aortitis". Gradually as he proceeds he comes to refer to the dilated syphilitic tube as the "Hodgson-Welch Aorta". It is indeed well for us to know that an English speaking doctor, as early as 1876 accurately, if not elegantly, described the condition, and his name is now most often associated with the disease. Nevertheless, Allbutt's monograph on aortitis has a huge number of references to German speaking investigators, and despite the difficulty of repressing our strong international disgust, we must be willing to acknowldege their great worth. They were early in making the routine use of the Wassermann test, and should, with the French and the Americans, be given credit for the early use of the X-ray in chest diagnosis. More than these things they were early in doing detailed and accurate autopsies. Gruber's monograph[10] in 1914, on Dohle-Hellersche Aortitis, is a good example of the clinical adaptation of pathological knowledge previously developed: of 120 cases, with 27 autopsies, the Wassermann reaction was positive in 100; only 41 gave a history of having syphilitic infection. Such reports with similar findings soon multiplied until it came to be generally assumed that all aortitis was likely to be syphilitic and that all aneurysms should be associated with a positive Wassermann reaction in the blood. In general, it is likely that American writers have failed to find as much evidence of non-specific aortitis as one might assume occurs in England, from a perusal of Allbutt's book. To this, and several other matters of unusual interest, I will presently bring forward such evidence from my own records as has a bearing on the subject. In the meantime, in a field so full of interest and consequent distractions, we must coerce ourselves into focusing our attention on the main factors.

PATHOLOGY OF AORTIC DISEASE

We seem to know as much about syphilitic aortic disease as we can likely hope to know, unless we should be given ultimately a specific preventive or a more specific cure. With this in mind, we might devise a set of postulates, stating that a disease to challenge our utmost capacity and public duty, should offer:

(1) A known specific cause and technical methods enabling its identification and its experimental use (animal inoculation).

(2) Its pathological imprint on the tissues should be identifiable.

(3) It should admit of clinical diagnosis and differentiation from conditions producing similar changes.

(4) We should have a prevention and a cure.

Little amplification is needed to bring out these features as applied to syphilitic disease of the aorta; the features of interest all co-ordinate.

We may pass over the first statement with the remark that the skillful use of the dark field method, in the time requiring two generations to move across the stage of life, should do for aortic aneurysm what vaccination and water purification have done for typhoid fever. In that day there will be no mention of harmless, penile sores.

The pathological imprint on the tissues is unmistakable, and despite its familiarity merits repetition. The well known perivascular inflammatory infiltration, via the vasorum of the aorta, gradually cuts off these small vessels. The more or less persistent gummatous in-

vasion, despite apparent periods of latency, results ultimately in weakening and dilatation. There is every reason to believe that the acute round cell infiltration indicative of activity is by no means as resistent as the connective tissue resulting when active infection is subdued. The typical aorta when viewed shows insunken, depressed areas, corresponding to the different degress of media thinning the raised edge is due in part to some proliferation of the intima. The aortic ostium is affected in a three-fold manner: (1) It causes adhesion of the valve cusps to the aortic wall. (2) Separating the cusps at their periphery, and allowing a maximum of regurgitation. (3) About one-fourth inch from the plane of the valve it produces a scarring and a swelling that tends to gradually close the coronary arterial opening. The first two are constant evidences of syphilis; the last occurs typically in syphilis, but may occur in certain non-specific inflammation. The coronaries in their course are never plugged by syphilis, and like the peripheral vessels seem to escape. Where the heart is affected by gumma, the aorta is apt to be free*. Aortitis as a rule, precedes the valvular involvement. So definite is this pathology**, that even though decidedly overgrown with atheroma and intimal changes, the true cause can be distinguished. I recall seeing at autopsy a calcareous cast of the entire ascending aorta, with a definitely dilated tube. Nevertheless, stripping off or cutting through the surface, characteristic media changes of syphilis could readily be distinguished. To Allbutt are we indebted for assigning to the intimal changes their very minor influence on hypertension and allied disorders.

Atheroma is really a form of decay, seen earliest in the aorta as a rule near the base of the valve cusp, and not crippling it. The surface fatty degenerative plaque is usually underlaid by a chalk deposit. Rheumatic or streptococcic infection also singles out the aortic cusps, but when it does it never attaches them to them aortic wall, although they may adhere to each other. The valve cusps are prone to shrink in their radial axis, and leave an opening in or near the middle. Stenosis is impossible with a purely syphilitic valve; it is quite likely with a severe rheumatic. In the latter the mitral cusps rarely escape involvement also.

CLINICAL DIFFERENTIATION

Identifiable clinical data conform unusually well to those pathological differential criteria. The age incidence becomes of paramount interest, and certain rather dogmatic statements become quite justifiable. (1) Any uncomplicated aortic insufficiency coming on after 35 is probably syphilitic. (2) Rheumatic aortic insufficiency occurs at a much earlier age period, and is usually found unassociated with mitral disease. (3) Sudden death from aortic insufficiency occurs at an age period which those with early rheumatic etiology are not apt to attain. The "cor bovinum" is an unstable organ. But, just as it is possible to have a combination of striking atheroma and syphilitic disease of the wall, we may have a combination of rheumatic and syphilitic disease of the aorta and valves. I wish to report the striking features of such a combination.

Male, aged 46, first seen five years ago. He had been ill about two months with acute endocarditis, with some shifting arthritis. I saw him in consultation with Dr. C. H. Mason of Superior, Wis., under whose care he proceeded to good, fair recovery. When the acute symptoms had subsided a mitral and aortic insufficiency were very apparent. Reasonable compensation supervened, and the man went back to fairly heavy work.

Now within a year, I have re-examined him; he has a large thoracic aneurysm, a positive blood Wassermann. He admits having had gonorrhea, but denies chancre. In all probability, his aortitis was present even at the time he had his acute rheumatic infection, and the one condition was superimposed on the other. This is not an uncommon association post-

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*I recall several years ago doing a coroners autopsy on a man aged 36, who had left home in the morning perfectly well. His family did not know he had been at all sick. He dropped dead on his way home to lunch. At autopsy a large gumma was found occupying the apex of the heart and part of the interventricular septum. His aorta was perfectly free.

**This has been written up so often that one hesitates to reiterate, but article after article is read wherein the writer has not made himself clear or has a misconception of the facts. A good illustration is a recent and otherwise excellent article (Tyler, A. F.: Syphilis of the Great Vessels; Am. Journ. of Syphilis, Vol. IV, No. 1): "The Pathology found is—that of the Syphilitic Plaque, followed by a weakening of the wall.—The aneurysmal sac is made up of intima and an adventitia—the media not being present. This is due to the fact that the media has ruptured under pressure from within, and the more tenacious (?) inner and outer coats withstand the stretching (?). (All abbreviations and italics are my own additions.—E. L. T.)

mortem. I simply wish here to point out that clinically the differentiation can also be made.

So called "Atherosclerosis", represented, as it is chiefly by intimal degenerative changes, can be objectively demonstrated, either by palpation of the superficial arteries or by a study of the eye grounds, or a Roentgen visualization of some artery technically demonstrable, such as the posterior tibial or the dorsalis pedis. This latter procedure has been routine in our examinations for some time in conditions such as intermittent claudication, true angina, diabetes, or other trophic disturbances of the extremities. In many instances Roentgen plates show delicate, intricate structural detail, pointing to the general degree of arterial degeneration. In fact, there are some plates of the chest that seem to show shadows arising from the intima of the aorta.

PHYSICAL SIGNS

A study at this time of most of the methods other than Roentgenological for determining the degree and amount of dilatation or lengthening of the aorta is quite profitless. So many signs have departed with that euphonious and alliterative rarity, the "tracheal tug". No doubt Hoover is right in holding to the value of Huchards' early teaching and this would be particularly true if it were all we had. But, palpatory and percussion signs of minor degrees of either aortic dilatation or elongation, are extremely elusive, and most of us might better admit it. The conformity of the chest varies so much, and the subject whose chest is best adapted to normal percussion and palpation is not the one who may have the disease. In the same manner, any kind of uncomplicated systolic murmur, particularly at the base of the heart, is strikingly suited to stimulate the wildest imagination. For the time being, at least, until our knowledge is greatly furthered, systolic murmurs as unassociated signs, should be practically disregarded. On the contrary, diastolic murmurs, as has been so often said, are full of meaning. Curiously enough, some of these minor ones are best heard with the unaided ear in contact with the chest wall. Further than the well known differentiation, based on diastolic murmurs at the base, in the customary areas, the next most valuable differential point is the quality of the tone. Quite as important as the character of the sound, is the position where it is heard. Potain is credited by Allbutt with attempting to vivify the tone by likening it to that produced by an Algerian drum—the "bruit de taburka"*. On the other hand, the measuring of sounds and their interpretation, is almost altogether subjective. It is curious how difficult it is to decide by the character of the tone either the position the aorta occupies in terms of the chest wall, or the degree of tension within its lumen. Hoover's contention that it is practically altogether a question of how close the aorta has come to the chest wall and the amount of tissue intervening, is somewhat borne out by a patient recently examined with an extensive tuberculous infiltration proceeding from the right hylus up into the upper lobe. On forced expiration the second aortic tone would be said to be normal; after deep inspiration there seemed to be enough traction to the right to produce a tone very closely simulating the bruit de taburka. In weighing this important source of evidence it is fortunate that we do not need to rely on it exclusively. Syphiltic mediastinitis is apt to be an unconsidered part of most syphilitic aortic pathology. This probably accounts for the fixation other than pulsation, so that the hint that auscultatory and percussion findings in syphilitic disease are not so liable to respiratory influence, is correct.

ROENTGEN EVIDENCE

A recent article by Martin[11] from the Roentgen-ray Department of the Massachusetts General Hospital, summarizes well the roentgen possibilities and gives the results of their studies. Using a standard distance of 7 feet from the plate, he reports the distance from the right border of the ascending aorta to left border of the descending aorta to be between 4.5 and 6 cm. Chronic endocarditis, arteriosclerosis, syphilis, hypertension, high diaphragm, and dilated pulmonary arteries, are discussed as agents distorting and widening its normal shadow. The reader is urged to consult the original article because it gives a good, fair, working standard.

With plate confirmation, a man well trained

*I have on a number of occasions been struck by the remarkable features of this tone, and have made correctly a provisional diagnosis of aneurysm in the early stages of the examination.

in the use of the fluoroscope should not overlook any definite variation in the shadow of the great vessels. It is rightly not expected of the radiologist to always be able to give a specific cause of the shadow increase. Yet, the prominant knob at the upper left is indicative enough of arterioselerosis, and certainly the bulging to the right in the region of the ascending aorta is with very few exceptions syphilitic. The time is here, however, when the patient's history and the entire clinical concepts will be associated in the production of an accurate diagnosis. So prominently does syphilis enter into the causation of the widened aorta, that it behooves us to devote more attention to the differentiation of those that are due to something else. An accidental combination of arteriosclerosis with hypertension should theoretically give a combination that would tend to develop a uniformly dilated aortic tube. Fortunately, I have one such case, very thoroughly studied, which I am satisfied shows a rathered marked aortic stretching, that is due to this combination.

Mrs. T., Aged 59. A presenile woman, showing a greatly shrunken skin and generally undernutrition. She has bilateral cataracts, and presents a rather forlorn appearance. The blood pressures are 130 diastolic and 260 systolic. From the kidney standpoint, she has nocturia, a trace of albumen usually, with a few casts, a P. S. P. output of 50 in 2 hours, and blood test showing no evidence of retention of nitrogenous end products. She has been diagnosed as a "kombination" form of nephritis. She is a thin, fair individual, and the chest plate shows clearly enough definite aortic dilatation in both the ascending and descending portions. She has repeatedly negative Wassermanns.

Our studies on hypertension (F. J. Hirschboeck[12]), confirm the general assumption that syphilis cannot be considered more than a minor agent in its production. It is said that syphilitic aneurysmal dilatation will give a denser shadow than the simple dilatation due to arteriosclerosis. The plate in this case would tend to lend weight to that observation.

It is well known that hypertension alone, possibly as Martin[11] states, when associated with a high diaphragm will produce a widening of the great vessel shadows. Numerous instances could be brought forward to support this contention. The various combinations of cardio-renal disease and possibly late arteriosclerosis, are prone to be intimately mixed, and it is very certain that the roentgen evidence must be considered a part of the whole. Studies of the patient in the oblique position and a proper interpretation of the aortic knob, the questions of pulsation, posteriorly as well as laterally, heart fixation or displacement downward to the left, conformity of the spine, are all technical but very important points.

The influence of mitral disease in changing the basal shadows, will not be considered in this article. Four instances of congenital heart disease, which were diagnosed either as a pulmonary stenosis, patent ductus Botali, or simply labelled "congenital heart disease", leaving the lesion undetermined, were cases with such unmistakable clinical signs, as to make the condition difficult to confuse with the processes under consideration.

MEDIASTINAL THICKENING

Concerning the mediastinum, there are many points of unusual difficulty that arise. Ruling out substernal thyroid, the thymus gland, and acute mediastinal inflammatory accumulations, we have to deal chiefly with syphilitic, tuberculous and malignant disease. Syphilis has been studied, as a primary source of mediastinitis by Giffin[13] and others, but as has already been mentioned, it is a usual addition to a syphilitically diseased aorta, and in many cases of aneurysm is a very destructive association, complicating the diagnosis and inducing changes in the bronchi or lung, confusing our ordinary standards.

G. R., a woodsman, male, aged 43, was under our care off and on for three years. At autopsy we found a very large aneurysm, eroding the spinal column. To summarize only the crucial data: During the pre-aneurysm formation period, he had numerous negative blood Wassermanns. Yet a physician who had treated him six years previously for an "enlarged liver" and "ascites", said he lost all his symptoms under anti-specific treatment. Under my care his chest pains and a slight degree of hoarseness responded quite well to a short course of anti-specifics. Later on, in the course of his disease, and when the aneurysm had al-

ready formed, the roentgen evidence was as misleading as the serological had been in the beginning: he developed what his attendant called a pneumonia; thereafter his decline was persistent and rapid. Our roentgen findings were identical with those of the Mayo Clinic, where he was also examined during that stage of his illness. A report from Dr. R. D. Carmen reads as follows: "The X-ray finding was fluid filling the entire left chest; the urine, sputum and Wassermann tests were negative.—Aspiration in the eighth interspace was negative.—An incision was made down to the pleura; there seemed to be a slight amount of movement underneath.—The fragment removed for microscopic diagnosis was negative. — There was nothing in his findings to suggest aneurysm during his visit here." Our preautopsy diagnosis was malignancy, arising from the mediastinum. We found a large dissecting aneurysm of the descending aorta, eroding into the vertebral column and strikingly encased by it. The left lung was as hard and as firm and dense as liver, and when the specimen was X-rayed, attached to the heart, showed a denser shadow than the heart itself. Passing the finger into the left pulmonary vein, a point of compression and closure could be easily made out. The lung, grossly and microscopically, showed nothing more than an intense passive congestion.

Here we have the striking evidence, with autopsy confirmation of a failure both of the Wassermann and the Roentgen-ray to properly identify the condition.

A striking case of tuberculous mediastinal infiltration concerns a male, aged 48, who had consulted numerous physicians and hospitals. He had evidently had an old pulmonary tuberculosis, later a hypertrophic arthritis deformans complicated the picture; but ultimately an interference with the return of the venous blood from the superior vena cava gave most startling venous enlargement of the veins in the neck and trophic disturbances in the right upper extremity.

This sort of process would naturally be expected in a fibrous or shrinking type of tuberculosis, chronic and persistent in its course. More difficult of differentiation are some of those cases in young children, presumably having large masses of tuberculous gland elements at the biforcation of the bronchi and thereabout.

Primary malignancy, including Hodgkin's disease, is accountable for more conditions of the true mediastinum proper than either tuberculosis or syphilis. In the way of differential diagnosis, the patency or distortion of the oesophagus, as determined by the usual methods, yields practical aid. Several cases of supposed malignancy we have observed run a very chronic course, and unfortunately, autopsy confirmation has been withheld. In these cases one is always left with the uncertain feeling that despite negative findings they might still be syphilitic, and that at least a therapeutic trial is merited. In general, we should remember that despite our so-called specific methods, the therapeutic tests for syphilis is just as good now as it was at a time when it was the chief standby of the clinician.

THE PRESENT STANDING OF THE WASSERMANN TEST

Three patients in this series deserve unusual consideration. **All three were observed carefully at a time when in the course of a general examination the Wassermann was reported positive.** Nothing was found, either in the history or physical examination, to account for the positive finding. Two of them only had a moderate amount of treatment, and the third had none. Yet, within a period of three, five and six years respectively, they all return with definite aortic aneurysm, two in the ascending portion and one in the descending. Despite all that has been said about the danger of taking a positive blood Wassermann too seriously, experiences of this kind are apt to weigh very heavily with the conscientious physician. I am inclined to believe that we are prone to accept negative blood findings altogether too seriously. There are known to be a considerable number of late aortic aneurysms even, with negative blood findings. The use of provocatives to stimulate positive reactions is probably also less conclusive than previously held. Even negative tests in the spinal fluid must not be taken as conclusive evidence ruling out syphilis. If this has been demonstrated in true disease of the cerebrospinal nervous system, how much more so should we be cautious in accepting

DIAGNOSIS.	Male	Female	Average age	Youngest	Oldest	Social Status		Syphilis Admitted		Blood Wass.			Cough			Substernal Oppression		Dyspnoea			Bronchitis & Cough		Angina Varying Forms		Died	Fluoroscopy	
						Married	Single	Affirmed	Negative	Positive	Negative	Not taken	Severe brassy	Moderate	Absent	Present	Absent	Severe	Moderate	Absent	Present	Absent	Present	Absent		Positive	Negative
A Aortic Aneurysm	18	2	49.4	25	62	15	5	4	16	12	5	3	7	6	7	18	2	8	3	9	11	9	4	16	11	20	....
B Aortic Aneur. & Aortic Insuf.	5	0	54	35	66	3	2	1	4	3	1	1	3	1	1	4	1	4	0	1	4	1	3	2	1	5	0
C Aortic Insuf. Syphilitic	4	1	45	30	62	4	1	2	3	5	0	0	0	2	3	4	1	5	0	0	2	3	3	2	1	CH 5‡	0
D Aortitis Syphilitic	7	0	38.5	28	59	4	3	2	5	7	0	0	0	0	7	7	0	5	2	0	0	7	?	?	1	2?	5
E1 Aortic Insuf. Rheumatic	8	10	27⅓	14	15	9	9	0	0	0	0	5	0	0	16	2	16	15*	0	3	0	18	0	18	5	....	....
E2 Aortic Insuf. & Mitral Insuf.	9	2	32.5	15	57	6	5	0	11	0	5	6	0	0	11	0	11	3*	0	8	0	11	0	11	2	....	....
F Angina Pectoris	13	2	62	49	74	14	1	0	15	0	7	8	0	3	12	15†	0	7	0	8					8	....	....

*Amount of, dependent on state of compensation of heart.
†Differentiation of character of pain is made in body of article.
‡C H (Cardiac Hypertrophy.)

negative spinal fluid as being determinative for lesions elsewhere. More will be said on this subject in the discussion of the cases of aortitis.

CLASSIFICATION OF CASES

A table is shown, dividing the cases that have been observed into certain groups, with the usual age, sex, social status, and dominating symptoms graphically shown.

Groups "A" and "B": (both aortic aneurysm and aortic aneurysm associated with aortic insufficiency will be considered here together). Of the 25 cases, 23 were males; 18 married and 7 single. Of the 10 who had children, a total of 28, 7 belonged to a man who contracted his syphilis, however, after his wife died, and there would be no suspicion of hereditary influence on his family. The remaining 9, therefore, had a total of 21 children. Syphilis was admitted by only 6, and denied by 19. The Wassermann positive in 16, negative in 6, and was not taken in 3. The average age 54.4, the oldest being 66 and the youngest 35. There was only 1 doubtful case, in which there was a fair history of rheumatism, but with a positive Wassermann. The cases were observed for a period varying from 1 to 5 years, with an average of 1.5 years. Eleven died, and 6 autopsies were made, all showing aneurysm of the ascending and arch of the aorta, except 1 in the descending aorta. Nine are still living, and show some improvement. Five are current and severe, and show no improvement. The fluoroscope gave positive evidence in all except the 1 doubtful case above mentioned. Ten were in the ascending aorta, 9 in the arch (usually involving some of the ascending aorta as well), 2 were in the descending aorta, 1 distinctly ab-

dominal with a mass protruding below the ribs, and 3 designated as diffuse. Five, as noted in the table, were associated with a definite aortic insufficiency.

LEADING SYMPTOMS

Cough, dyspnea, substernal oppression and varying degrees of pain (angina) were most marked when the brunt of the dilatation was at or near the arch. Nevertheless, one of the cases of aneurysm of the descending aorta gave the most excruciating pain. Recurrent laryngeal involvement, with a brassy, characteristic cough, was observed in 7. An analysis of the cough is difficult, because it varies with, and depends on, the associated bronchitis or degrees of pressure. The change from time to time, dependent on the faulty drainage, associated infection, etc., must vary the amount of cough from period to period. Substernal oppression and the degree and extent of pain certainly seem to go hand in hand, but in only 2 cases could the type of pain or distribution be said to stimulate in any definite degree true major angina. Six cases, despite the position of the aneurysm, gave the seat of their distress in the epigastrium, and suspected stomach disease, suggesting that some of the earlier signs of aortic disease, like that of the heart, may be gastric. As isolated symptoms, 9 had severe cough, without much chest pain or oppression; in 3, dyspnea occurred only after considerable excitement and effort, despite a very large aneurysm in the supra-sigmoid region. Naturally, those associated with aortic insufficiency had the greatest degrees of dyspnea arising from exercise, and were not so associated with either cough or substernal oppression. In these specific aortic insufficiencies, cardiac hypertrophy was not found to the degree usually encountered in the non-specific type. Myocarditis, while present in most of the late cases, was not mentioned in the beginning as having any influence in 16 cases. A rheumatic history was given in only 2 cases that seemed reliable: 1 is mentioned above as an association of both rheumatic and syphilitic disease, and in the other the diagnosis is still questionable. Rheumatism was alleged in 6, who thought that their chest pains were rheumatic in origin.

Two had tabes; 1 a gastric syphilis with hour-glass contracture; 1 a definite ophthalmoplegia externa; 1 a severe postoperative abdominal hernia; 1 severe abdominal pain associated with attacks of jaundice. The diagnosis lies between gall bladder disease or a gastric crisis, and probably is the former. Four had leg ulcers, thought to be syphilitic, that responded to treatment.

SYPHILITIC AORTITIS

This term is rather loosely used. What is meant is the aortic wall involvement before aneurysmal change has taken place. This number here included might be made much larger were a little more courage available. The term has been held down rigidly to include only those having: (a) substernal oppression, usually increased by exertion, and some pain; (b) a general sense of incapacity usually out of proportion to any demonstrable physical perversion;* (c) persistent positive Wassermanns in the blood; (d) decided improvement under anti-specific treatment.

Of the 7 cases, all were males; the oldest 59, the youngest 28, the average 37; 4 were married and 3 single. No rheumatic histories nor evidence of endocardial involvement found. All improved markedly under treatment except one, who took almost no treatment, and had a tragic death, presumably due to coronary closure. He had foresight enough, however, to get a very large insurance policy a relatively short time before he died.

Three cases spoken of under "Aneurysm" certainly were aortitis when they were first observed, but they were not catalogued as such until outspoken aneurysm was present.

We should be very slow to try to explain away positive Wassermanns, and equally loathe to accept negative blood findings as determining whether a patient needs treatment or not. This must be our attitude until such time as known syphilitics have tattooed into either their memory or their skin a permanent record of what has been known concerning them or what treatment has been given, and the reasonable diagnosis made at the time. There would still be, of course, a large number of individuals who acquire syphilis and have no knowledge of its early implantation. Yet, we would go a long

*Allbutt's contention that the pain arises from subadventitial irritation seems to receive general support.

way if the known cases* would carry around with them as one of their priceless treasures a document similar to an army discharge paper, giving in detail a history of their case and the amount of treatment they have had.

RHEUMATIC AORTIC INSUFFICIENCY

Twenty-nine cases, for purposes of comparison, are studied as to their symptomatology. Eighteen were diagnosed as a primary aortic insufficiency without mitral involvement, and this seems higher than the usual statistics given. The history and the age, however, conform to the usual standard: the youngest included is 14 years, and the oldest 57. The age average of the pure aortic insufficiencies is 27.3, and of the entire series 32.5. Two patients unusually well along in years for their respective lesions, raised the average considerably higher than it otherwise would have been.

Aside from cardiac hypertrophy and the types seen, the roentgen evidence would be said to be negative. The same is true of the Wassermann test, and certainly none of these could be confused in the presence of striking objective symptoms with the syphilitic individual, with his disease confined to the aorta.

ANGINA PECTORIS

Fifteen cases, the average age 62 (the youngest 49 and the oldest 74), have been tabulated. Only two of the patients were females. It will be noted that the fluoroscope, as well as the Wassermann studies, have given negative results in all.

The intensity of the substernal pain and oppression was classified into four degrees, the degree being determined by the most severe of the attacks experienced. Numbering the groups I, II, III and IV, in degree of severity, all in Group IV had a sudden and tragic death. Three in Group III had sudden deaths, and one died of myocarditis and cardiac dilatation, the attacks letting up as soon as the heart muscle gave way. It is of interest to note that the remaining two groups all had hypertension of moderate degree, and would easily be classed as a possible stenocardia. In none of those dying suddenly had there been a hypertension.

Of a large number of syphilitics studied, none as yet has produced a patient with Group IV type of pain. Allbutt maintains that most patients with the true major angina, under 45, are probably syphilitic, and this appears to be sound reasoning. Not much comment would be made at this time were it not for the fact that we so frequently hear in stentorian tones the implication that syphilis is the chief source of angina pectoris. Such is the amazing and long enduring result of the courageous if not cautious experiment of John Hunter! It will simplify matters a good deal if we realize that angina pectoris or sudden death in the middle aged or relatively young may well result from syphilitic aortitis, and, that our ordinary male in later life, exhibiting the tragic, prostrating, grinding reminder of the grim reaper, will show the objective evidence of intimal degeneration. Now, whether this intimal process will concern the coronaries, or the aorta itself, or the coronary ostia, evidently means less in the production of the disease syndrome than it does in determining the nutrition of the myocardium. In brief, one need not expect to make an etiological diagnosis from a study of the intensity or the distribution of the pain; a routine study will show in most cases over 45 that the process is based on a primary arterial decay.

To properly safeguard those who have a generalized syphilis, more or less inactive, against the late structural degenerations of the aorta, is the great problem of the medical attendant. To be sure enough that syphilitic aortitis is present, so that proper treatment will be given, before objective changes are determinable, requires judgment and a sincere interest in the welfare of the patient. Careful histories, and still more careful serum studies persistently made, are invaluable. But, where valuable time has been lost and structural changes are already present, the time has come when we must avoid inefficient and meddlesome treatment, and give the most intense therapy that the patient can safely stand.

For the time being this brief reference to treatment is all that will be made. Our older conceptions of latency in syphilis must be modified. More or less active gummatous lesions occur in the aortic wall over very long periods. Replacement by connective tissue, firm and strong, is far preferable, as has been pointed

*The recent work of boards of health, including our own State Board of Health, is an excellent start in this direction, and physicians should cheerfully co-operate.

out before, to the loosely structured round cell infiltration. The treatment eliminating the gumma will at the same time constitutionally support the patient, and usually rid him of numerous lesions elsewhere. What is needed is a conscientious, scientific, early diagnosis; to be followed by an equally logical, intensive and persistent line of treatment.

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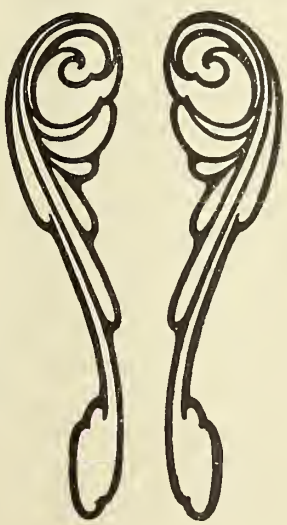

CHRONIC INTERSTITIAL NEPHRITIS IN CHILDREN*

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A chronic interstitial nephritis whose most marked symptoms are excessive thirst, polyuria and retarded physical development, occasionally presents itself in childhood.

The literature of the past fifteen years contains reports of sixty cases, nearly all of which were described in England. Its reported incidence in other countries has been small. Out of seventy-three cases of chronic nephritis in children seen by Heubner only one was of the interstitial type and in this country. Hill, of Boston, who in recent years has studied the subject of juvenile nephritis more extensively than any other American, reports only one case of the severe chronic interstitial form. That the condition is rare in England is evidenced by the fact that of five hundred and seventy-five cases of the disease collected by Sawyer, none occurred under the age of ten years and only four under twenty.

Furthermore, Sawyer found only one instance of the disease in a patient so young as eighteen years in the records of Guys Hospital from 1872 to 1882.

Parkes Weber states that as a cause of juvenile polyuria, it is less frequent than diabetes insipidus. One may question Parkes Weber's dictum; but nevertheless accept the inference as to the rarity of the disease in childhood.

It may be that in the past this disease would have been diagnosed more frequently in childhood were it not for certain conflictions.

One is pollakiuria. The practicing physician is so accustomed to the tale of frequent urination amongst children that he is tempted to overlook polyuria. Another obstacle to correct recognition lay in the lack of modern methods for determining renal function and in the absence of knowledge as to the effect of pituitary preparations upon the polyuria of diabetes insipidus. It is the writer's belief that many patients formerly reported as having diabetes

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insipidus, were in reality suffering from the juvenile form of chronic interstitial nephritis.

The two cases whose study forms the basis of this paper illustrate the familiar tendency, the symptomatology, the difficulty of recognition, the methods employed in the diagnosis and the poor prognosis of this disease.

The first patient, Jean S., 9 years of age, had been troubled with excessive thirst and polyuria for five or six years. There was no definite time of onset and her parents were not certain but that her great thirst had begun even earlier. The parents and one other child are well, but an older brother of the patient died of nephritis when eleven years old. There was no evidence of syphilis and the Wassermann reaction was negative.

When first seen, the patient was drinking large amounts of milk and was having morning bouts of vomiting. Physical examination disclosed nothing of importance save for a dry skin, moderate malnutrition and retarded physical development. Her urine output averaged four liters daily, ranging from two to six. Its specific gravity varied from 1.002 to 1.009. Casts or red blood cells were never found; but there was frequently a marked trace of albumen. Her eye grounds were normal and her blood pressure ninety-six systolic an sixty-eight diastolic. It is obvious that it was nececssary to exclude diabetes insipidus.

Her blood urea at the first examination was 105 mg. per 100 c. c. When her excessive milk intake was reduced, this fell to below 30 mg. and her vomiting ceased. Her blood urea remained low and ten months later was under 20 mg.

Dr. L. G. Rowntree saw this patient and many of the tests were carried out under his direction. Her average two-hour phthalein output was 12 per cent as contrasted with a normal at her age of 60 to 70 per cent. On a Mosenthal test diet, the specific gravity of her urine showed a definite fixation of from 1.007 to 1.009. It is evident that her kidney function was definitely impaired despite the apparent absence of urinary abnormalities on first examination.

In addition to chronic interstitial nephritis renal impairment resulting from congenital polycystic kidneys might conceivably produce the same picture. Such kidneys are nearly always enlarged. In this patient there was no palpable kidney tumor and no radiographic evidence of renal abnormality.

Renal function in diabetes insipidus has been studied by Fitz and by Cowie. Both found a normal excretion of phenolsulphonephthalein and Fitz a normal non-protein blood nitrogen.

Significant renal pathology has not been found post mortem in known cases of diabetes insipidus. The literature, however, contains a report by Heubner of an autopsy which showed contracted granular kidneys and a tumor of the hypophysis.

It has been definitely shown that the administration of preparations of pituitary gland will diminish the polyuria of diabetes insipidus. The feeding of raw gland substance and the injection of its commercial preparations had no result in this case.

The second patient, Robert P., was brought in because of failure to gain in weight. He had marked rickets with genu valgum. He was obstinately constipated and his rectum was filled with impacted feces. The father and mother were well. They had had one previous child who had developed a polyuria at the age of six months and had died at the age of three years of "Brights Disease."

The patient was said to have been healthy until he was weaned at fourteen months. He then had tonsilitis with fever for two and one-half weeks and his parents believe that his trouble dates from that illness. It was difficult to obtain all the patient's urine, but his fluid intake averaged two liters a day, or about one fourth his body weight. He was always thirsty and required water many times during the night. On one day 1225 c.c. of urine was collected. The specific gravity was nearly always from 1.008 to 1.010. A trace of albumen and a few casts were present in nearly every specimen. His two-hour phenolsulphonephthalein excretion was 11 per cent on one occasion and 15 per cent on another. His blood urea on a low protein diet was 16.6 mg. Creatinin determinations were not made. No kidney tumor could be palpated. His blood Wassermann was negative and he showed no signs of syphilis.

The evidence in this case pointed so clearly to nephritis as the cause of the patient's trouble

that no study was made of the effect of pituitary extract.

As regards the etiology of this disease in early life, little is known. Several of the reported cases were very evidently due to lues. That it follows an acute diffuse or parenchymatous nephritis is argued against by the fact that only a small percentage of the reported cases have been known to have had a preceding acute nephritis with edema. In fact the history of edema is noticeably lacking. However, it is possible that such a condition could have developed during intra-uterine life. In fact, Karsner reports a well developed baby who died forty-five minutes after birth and on whom at autopsy there was found an acute parenchymatous nephritis. Acute parenchymatous nephritis has been observed by several reporters during the first weeks of extra-uterine life.

Sawyer points out the difference between the sex incidence of parenchymatous nephritis which he states occurs more frequently in males than in females and the ratio in the interstitial form which in his series of forty-six collected, was as two males to three females and believes that this discrepancy argues towards some other cause than a preceding parenchymatous nephritis.

The familial character of this type of nephritis has been previously pointed out by Dickinson and Barber.

Autopsies reported by Miller and Parsons, by Naish and others, uniformly showed small shrunken granular kidneys, usually weighing less than an ounce and with fibrous overgrowth and lymphocytic infitration of the interstitial tissue.

Neither patient showed increased blood pressure or cardiac enlargement. This is in accord with the majority of reported cases.

Both of the writer's cases were obstinately constipated, apparently the result of the organism's great demand for water with consequent inspissation of the contents of the bowel. This symptom was successfully treated with liquid paraffin. Otherwise treatment was directed towards building up and protecting the child, the diet containing protein largely in the form of milk, the quantity of which was limited.

The first patient reported spent the winter in Florida, but died shortly after her return, probably from uremia. Her home was in another state and no autopsy was made.

These two cases and those gleaned from the literature combine to give a composite picture of juvenile chronic interstitial nephritis as follows: A female child rather poorly developed and somewhat under nourished, her skin is dry, rather brown, and somewhat inelastic. Her most troublesome symptom is thirst. Further study reveals first, polyuria, and second impaired renal function. She is always on the brink of urema and lives at the most only a few years past childhood.

The writer wishes to emphasize the following conclusions: First, that in any chronic disease of infancy or childhood accompanied by wasting or retarded physical developement it is necessary to study the function of the kidneys more extensively than is done by ordinary examination of a single specimen of urine. Second, that since in chronic interstitial nephritis, as it occurs in childhood, large quantities of urine may be passed containing none or little albumen and no casts or erthrocytes, other tests of kidney function must be made before the kidneys are pronounced sound and some other diagnosis, as for example that of diabetes insipidus is made.

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DISCUSSION

DR. L. G. ROWNTREE, Rochester: I think that the paper of Dr. Taylor is very timely. I have seen two cases of this disease in addition to those reported by Dr. Taylor, and possibly one other, making a total of five. In all but one instance the initial diagnosis, before studies were made, was incorrect. I think that I can probably emphasize the difficulties of diagnosis by relating a story.

In the early days of our work with phthalein we found in the ward a child about 10 years of age diagnosed diabetes insipidus. On going into the history of the case we found this patient had visited the dispensary at Johns Hopkins, and on account of the polyuria and the low specific gravity of the urine, was considered a case of diabetes insipidus. After entrance to the hospital the patient was used as the subject of many discussions on diabetes insipidus. Dr. Geraghty and I were interested and made tests of the renal function, and were tremendously surprised to find 7 per cent phthalein output. We made a diagnosis of chronic interstitial nephritis, despite the absence of eye ground changes, vascular and cardiac changes, and of albumin in the urine, although the dispensary history indicated that a trace had been found on one occasion. On a second test we found the output only 3 per cent, so we adhered to our original diagnosis. About three days later albumen appeared in the urine in small amounts. The next day the child developed headache, on the third day convulsions, and on the fourth day, died. The autopsy revealed an advanced chronic interstitial nephritis.

Here, then, was a clean-cut case of chronic interstitial nephritis proven by autopsy, and diagnosed diabetes insipidus. The true condition was not recognized in the wards of one of our leading hospitals. It brings home the question of the diagnosis of chronic interstitial nephritis in childhood. Apparently in early childhood there was little or no change in the vascular system, such as is usual in the disease in older life. This may be because the tissues are young and vigorous, and the disease short lived, time not permitting of the vascular changes so common in this disease.

Albumen may appear intermittently. This does not help very much in the differential diagnosis, because in 16 out of 26 cases of diabetes insipidus reported at the Mayo Clinic, albuminuria was intermittently present; consequently, the presence or absence of small quantities of albumen would not help very much in the diagnosis.

The second case I saw in Vienna in the wards of Von Pirquet. There were two cases side by side putting out three to six litres of urine a day. Dr. Von Pirquet said that one patient had diabetes insipidus with a pituitary lesion, and the other had chronic interstitial nephritis. Renal functional studies were made at our suggestion and the diagnosis of diabetes insipidus showed a high phthalein output, while, in the case of chronic interstitial nephritis, it was greatly reduced. The diagnosis was really quite easy, since the child showed definite evidences of Frohlich's syndrome.

In addition to these cases, I have seen one other. This was also diagnosed diabetes insipidus. It was in a child, first seen at seven years of age, and again at nine. In this child the phthalein output was 20 per cent. Small amounts of albumen were constantly present. Because of complete failure to respond to pituitary extract, I firmly believe this is also a case of chronic interstitial nephritis. In many instances the diagnosis is one of exclusion. I do not believe that we can make a diagnosis of chronic interstitial nephritis in childhood until we have excluded diabetes insipidus. In some cases of polyuria with marked involvement of renal function, with the absence of reaction to pituitary extract, we can make a diagnosis of chronic interstitial nephritis, even in the absence of an albuminuria.

Dr. R. N. ANDREWS, Mankato: In going over the literature on the subject of chronic interstitial nephritis in children I am convinced with the author of the principal paper that this disease occurs much more frequently than we think. The reason that it is overlooked is because of the lack of careful diagnosis and perseverance in individual cases. I realize that the findings are often rather obscure, and yet when all the facts are taken into consideration the diagnosis can usually be made. We have many children come to us who are undersized, weak, generally run down, anemic, who are examined in a general way, with one examination of the urine and are treated as a case of anemia, when, if everything was considered in the way it should be, these very cases may have at the root of all their trouble, a chronic nephritis.

We must not lose sight of the fact that some of these children who have a chronic nephritis with the accompanying symptoms of general weakness, etc., may have back of all this a syphilitic taint. If all of these cases came to autopsy this would be absolutely verified, but as they do not, we can only suggest this in passing as being something worthy of a further consideration.

Much has been said concerning the classification of nephritis. It is claimed that a pure chronic interstitial nephritis is almost a nonentity. We may have a case showing all the symptoms of nephritis, such as polyuria, asthenia, visual disturbances, no edema, with low specific gravity of the urine, small amount of albumen, occasional casts and we are inclined to say this is a case of chronic interstitial nephritis; but when the case finally comes to autopsy there is

a pathology not only in the structural tissue, but also in the parenchymatous tissue. In other words, the two types of nephritis overlaps so that it is impossible to say that either one or the other exists in itself. Consequently they have adopted at Harvard this classification of a chronic nephritis:

Chronic nephritis
a. with edema
b. without edema
c. with hypertension
d. without hypertension

In going over the record of the Children's Hospital in Boston for the past fifteen years (this is a hospital of 60 beds), we find the diagnosis of pure chronic interstitial nephritis was made only once. The cases were examined there more carefully than they would be in an ordinary run of a private practice. The diagnosis is made in a good many of these cases as one of chronic nephritis, there being no distinction between the types. In the same period of time the diagnosis of diabetes insipidus was made five times, so in this institution at least, diabetes insipidus is more common than chronic interstitial nephritis.

There is a type of chronic interstitial nephritis, rather rare, which is found more frequently in England than elsewhere, associated with infantilism. In this type of case we have the polyuria, low specific gravity, 1003-1006, slight trace of albumen and a very few casts. Patient subject to headache, vision is poor and there may be an albuminuric retinitis. Blood pressure usually normal. Vascular changes may be nil, or there may be some cardiac hypertrophy and a high blood pressure. Functional tests are low and prognosis is bad. Etiology of these cases is unknown. A 12 to 13 year old child may be only four feet high and much under-developed. There are two types of cases; one with a chronic interstitial nephritis and the other type without a true nephritis; that is, without any renal disease but with a diabetes insipidus.

Dr. Lewis Hill, Boston, cites a case of a child seven years old, who, since a year old had been subject to bilious attacks. Child has always been thin. These attacks would come on once a month, then once a week, then two times a week, and would last from 12 to 24 hours. They would begin a 3 or 4 in the morning with headache and vomiting and would not bear relation to over-fatigue or over-eating. Child drinks a lot of water and passes a great deal. Urine negative, with an occasional trace of albumen, no casts, no blood. For the past two months headache has been almost constant, there is poor vision, and a week ago there was blood in the urine. Now we have an albuminuric retinitis, with no edema; specific gravity of urine 1010-1014, contains some granular and some hyalin casts. Phenolsulphonephthalein 55 per cent.

These cases illustrate how hard it is to make a diagnosis of nephritis early, but how easy it is when you have all the symptoms which are recorded here. It is these early cases that we should be on the lookout for and if possible diagnose. Most of these children do not seem very sick and nephritis would never have been diagnosed except for repeated examination of the urine with various tests applied.

We must bear in mind, however, that these children are always under-developed both mentally and physically. The blood pressure where the case is at all advanced, or where the disease has existed for some little time is usually high, there is cardiac hypertrophy and visual and gastric disturbances. There is polyuria and pollakiuria. This is the only form of nephritis in infancy in which the blood pressure is high with a cardiac hypertrophy. Whenever a persistent high arterial tension occurs with albuminuria and other signs of disturbed renal function, a case of contracted kidneys exists.

There are a few tests that are of practical value in making a diagnosis of nephritis, not only from the diagnostic, but also from the prognostic standpoint. First, is the functional test with phenolsulphonephthalein. It must be remembered that children run a little high, the normal average being 70 per cent. This test is reliable and should be used. Again, we have a two hour renal test of Mosenthal. This is ordinarily easy to carry out and is of considerable value in checking up a case. A repeated low phthalein test means the kidneys are severely damaged and the prognosis bad. Finally the examination of blood for creatinin and urea-nitrogen. This is more difficult because of the chemistry involved. A high blood urea is of a bad prognostic sign.

I do not care to go into the treatment of this disease because time will not permit. Again, there is considerable difference of opinion as to the methods to be used; suffice it to say in these cases a marked restriction of diet is not necessary; but hygiene and general living conditions are more important.

DR. ROOD TAYLOR, Minneapolis (closing the discussion): I presented this subject to bring out a good discussion, and that I think I have succeeded in doing. I feel that we have been very fortunate in having Dr. Rowntree come out here and stay here and teach us and stimulate us to know more about the subject of nephritis.

Dr. Andrews mentioned the diagnosis of infantilism. I purposely avoided it, although a number of cases are reported in the literature as renal infantilism, as chronic nephritis with infantilism, and so forth, because I think any chronic disease in early childhood, whether it be chronic nephritis, hepatitis, hematogenous jaundice, chronic intestinal indigestion, no matter what the disease is, it will produce a type of retarded physical development which is entirely secondary.

ACUTE DILATATION OF THE STOMACH*

By O. W. Holcomb, M. D.
St. Paul, Minn.

The term itself implies merely a symptom, but in common usage refers to a distinct entity of uncertain etiology, characterized clinically by a sudden onset, rapid distention of the abdomen, usually vomiting of quantities of dark watery fluid, and symptoms of collapse.

Brinton (1858) and Rokitanski (1863) were among the earliest writers to call attention to the condition. Later Fagge (1883) more accurately described it. Since this time a number of papers have appeared on the subject, and a relatively large number of cases reported.

The following points with reference to the anatomy and movements of the stomach are of interest. The stomach hangs suspended from the esophagus by its cardiac extremity. The pyloric extremity is more or less mobile. When empty it hangs almost vertically in the back part of the abdomen; when distended it rotates on its transverse axis so that the anterior surface is turned upward and the posterior surface downward. In this way the stomach is brought well against the anterior abdominal wall. The orifices are guarded by sphincter muscles normally in a state of tonic contraction. The opening of the cardiac sphincter occurs either as a result of pressure of food or drink from above or as a part of the reflex act of swallowing. The pyloric sphincter is opened by the presence of fluids or foods in a semi-solid condition, being especially favored by the presence of free hydrochloric acid. The stomach is regarded as an automatic organ, similar to the heart,—stimuli to movement arising within itself. In addition, it is supplied by regulatory fibres,—motor from the vagi and inhibitory from the splanchnics. The duodenum is the most fixed part of the small intestine; it begins on the right side of the body of the first lumbar vertebra, and ends at the left side of the second vertebra. In front of the third portion are the superior mesenteric vessels and the root of the mesentery (Davis).

Owing to our limited knowledge regarding the pathogenesis of acute dilatation, many theories have been advanced as to its probable cause. In the main, two groups of cases occur:

(1) Post operative; (2) Those arising spontaneously in which no operative interference has taken place.

In 1918 Doolin of Dublin collected 188 cases. In this series 69 per cent occurred after operations, while 31 per cent occurred in non-operative conditions. Of the operative cases 96 per cent occurred after operations on the abdominal viscera; 4 per cent after extra-abdominal operations. In the non-operative cases several factors may be responsible for the precipitation of an attack, such as overeating or injuries to the abdominal wall. The condition may occur during the course of acute or chronic illnesses; in rare instances after child-birth. Still others have been observed in cases of spinal deformity, and finally, a number of cases occur without any apparent cause.

For purposes of discussion, the theories regarding the etiologic factors may be divided into functional and organic or mechanical.

1. Functional.

Paralysis of the stomach. This is probably the most accepted explanation. It was first suggested by Brinton[1] and later supported by such writers as Steida, Von Herb, and particularly by Braun and Seidel[2]. In support of this it may be said that many cases occur in which no organic or mechanical factor can be traced either during life or at post mortem.

As to the cause of paralysis, Braun and Seidel conclude that it is due to alterations of gastric innervation-central, peripherial and reflex; that all surgical forms, as well as those occuring in association with infectious diseases, and with constitutional and other ailments, may be explained on this basis—that injury to the muscle fibers through mechanical, inflammatory or toxic lesions is possible, though no gross histological changes have thus far been observed.

Experimentally, the condition has been produced in dogs by section of the vagi[3], also in dogs under same conditions, which have had a gastro-enterostomy[4].

Under this division, too, must be classified

*Read before the Ramsey County Medical Society, St. Paul, April 26, 1920.

[1]Brinton (1858) Lectures on diseases of the stomach.
[2]Braun & Seidel Progressive Medicine, No. XL. p. 47.
[3]Carlon & Hallan (1895).
[4]Steida (1900).

those cases which have been observed to occur during anesthesia in the course of an operation. In several such cases the swallowing of air has been noted, and the cause of the dilatation attributed to this. Except as a factor operating upon an already prepared basis, this must be a neglible element, since none of the habitual aerophagics appear to be susceptible.

2. Organic or mechanical.

(a) Compression of the horizontal portion of the duodenum by the root of the mesentery and mesenteric vessels (Rokitanski). This is illustrated in cases of the removal of a pelvic tumor; the intestines sink down into the empty space and so put a drag upon the root of the mesentery with its vessels so as to cause a compression of the duodenum at its crossing. As opposed to this theory, is the rarity with which the condition is met after child-birth. And only in a small percentage of cases is there a noticeable degree of compression post mortem. (Doolin).

(b) Torsion or volvulus of the stomach.

When such an accident, though rare, occurs, ideal conditions are brought about to produce a dilatation, by the complete mechanical closure of both the cardiac and pyloric orifices of the stomach. But that this has no part in the average case of acute dilatation is demonstrated by the ease with which a stomach tube may be passed in all such cases.

It is evident that the malady may occur under the most varied conditions, but what the real factors are in its production are still sub-judice. Certainly no one theory thus far advanced explains more than a limited number of cases. Apparently then, while the effect may be the same, the development of a case may be the result of either a functional or mechanical derangement.

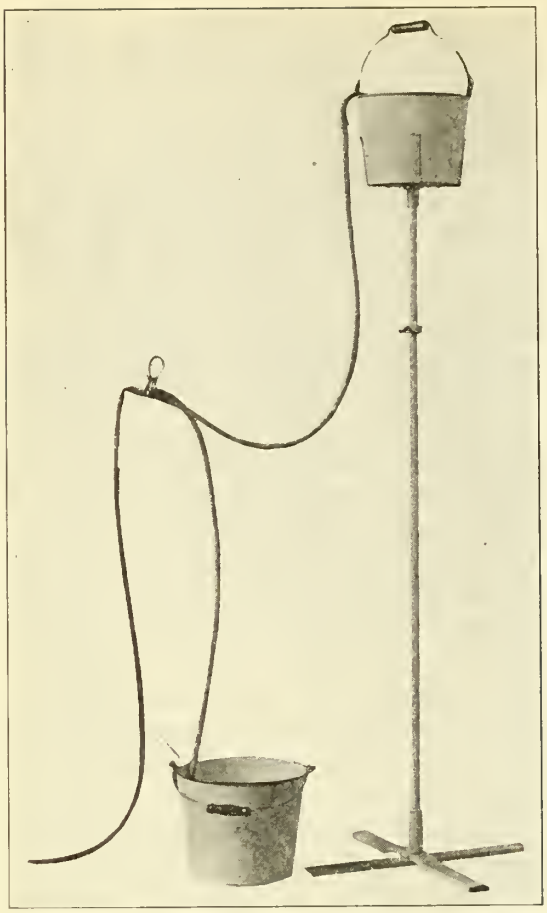
SYMPTOMS AND DIAGNOSIS

The condition may occur at any age, but the ages between 20 and 40 are most common. It occurs oftener in females than in males. Statistics vary, but approximately three-fourths of all cases occur after operations. In well defined cases the onset is sudden. In the post operative group, the beginning may be on the operating table or while the patient is still under the influence of the anesthetic. More frequently, however, there is a lapse of one to several days before symptoms occur to indicate anything out of the ordinary. Vomiting of quantities of green or dark brown fluid associated with a distention of the abdomen may be the first signs to attract attention. Unless relieved by lavage, when once begun, vomiting may be more or less continuous. A few mouthfuls of fluid accompanied by eructations are raised every few minutes without any particular effort. In most instances the vomitus is yellow at the onset, changing to green, and later to a dark brown or black. In some instances it may remain yellow throughout, and in these cases often has an offensive, almost feculent odor. The green color is due to the presence of bile, while the dark brown or black is the result of an admixture of blood due to hemorrhages consequent upon the dilatation. In the cases personally observed free hydrochloric acid has been absent.

The distension in most instances is very marked, in others extreme, so much that it greatly impedes the respiration as well as the heart action. The lower border of the stomach may reach well below the navel and in some instances into the pelvis. It is due in part to the presence of fluid, in part to gas. The source of both is still in dispute. Some hold that the gas is nothing more than swallowed air, while others believe it is the result of fermentation, probably both are important factors.

Equally interesting is the question of the source of the fluid. The rapidity of the recurrence of large quantities after removal, at times seems almost unbelievable. While the offensive character at times would indicate an intestinal regurgitation due to retro-peristalsis, yet the most plausible explanation would appear to be gastro-circulatory stasis.

Other symptoms of secondary nature follow in rapid sequence, such as respiratory and circulatory distress. The respiration is quick and shallow, the pulse rapid and feeble. The temperature falls. Often there is restlessness and an anxious expression. In some instances there is cyanosis and lividity; in others the complexion changes to a yellow waxy color. The tognue is dry and beefy, and thirst unquenchable. The urine is scanty and occasionally suppressed. Post mortem the stomach is described as being



Lundholm siphon apparatus for gastric lavage.

enormously dilated and occupying the greater portion of the peritoneal cavity. The gastric walls are thinned and the seat of numerous hemorrhages and erosions. In many cases the duodenum, up to the mesenteric crossing, participates in the dilatation. Keen[5] records a case where the first portion of the jejunum was also involved.

PROGNOSIS AND TREATMENT

The number of recoveries vary in direct proportion to the recognition and treatment of each case. The high mortality quoted by the early writers and the relatively large number of recoveries recorded in the more recent papers are sufficient evidence of this.

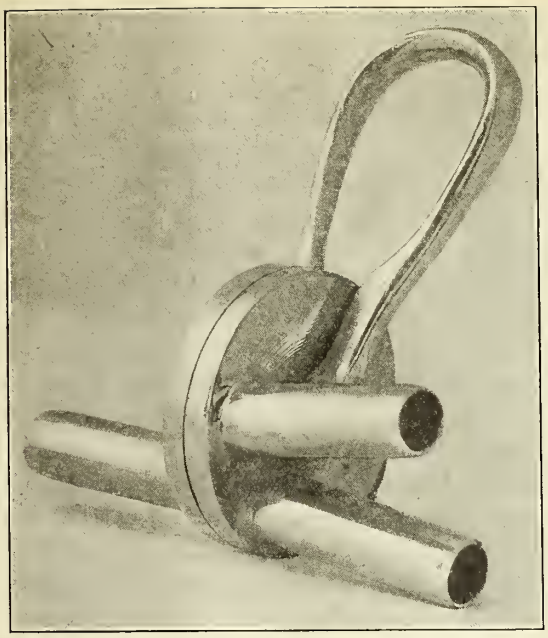
The prompt use of the stomach tube is the treatment par excellence and will save the majority of cases. All food, as well as water by the mouth, should be with-held and proctoclysis with rectal feeding instituted. Where the rectal salines are not taken well, hypodermoclysis should be given. As a rule the period is brief and every effort should be made to maintain whatever balance of vitality the patient may still possess. The manner and frequency of giving the lavage is important. A tube of rather large caliber is best suited for the purpose. Owing to the toxicity of the gastric contents it is essential that the lavage be thorough. At Bethesda Hospital we have been using an apparatus originated by the late Dr. Lundholm for this purpose. This device consists essentially of a three-way stop cock connected with tubes in such a manner that the water is first syphoned into the stomach from a pail held a couple of feet above the level of the patient, and then by a change of the connection, syphoned out of the stomach through a tube leading to a pail on the floor. Luke warm water is used and the washing is continued until the return is clear. By the use of this simple device the stomach is quickly and thoroughly washed. Just as soon as there is a tendency for the distention to recur, the stomach should be emptied and thoroughly flushed, whether it be in one, two or three hours. Ordinarily a lavage every three or four hours will accomplish the purpose and make the patient comfortable. In many instances the patients experience such a relief, that after the first or second washing they themselves give notice when a lavage is required. The washings are continued at specified intervals until the gastric contents return clear from the start of the lavage. At this stage feeding by mouth may be begun; water first, then liquids cautiously increased.

The other important form of treatment is the prone position first described by Sehnitzler. Of 26 cases reviewed by Borchgrevink[6], 22 recovered by this treatment. The patient is turned with the abdomen down, a pillow or two being placed under the hips for support. Considering the gratifying results reported by this simple method, a fair trial at least should not be neglected.

Except as circulatory stimulants and to meet symptomatic conditions, drugs have little or no value in the treatment of these cases. Bassler recommends a single dose of Elaterin in the form of the Titration of Elaterin, Gm. 0.032, by

[5]Keen's Surgery.

[6]S. G. & Ob., 1913.



Two-way cock, Lundholm siphon apparatus.

mouth as a purgative. Also enemas of powdered alum, Gm. 30.0 to 500 c.c. of warm water. Unless there are definite signs of organic obstruction which can not be relieved by lavage or posture, surgical interference is not indicated. Besides the improbability of relieving the situation, none of these cases are in a condition to either take an anesthetic or be operated.

SUMMARY

1. Acute dilatation of the stomach, while not common is by no means rare.

2. Though the symptoms are much alike, the pathogenesis is not the same in all cases. The geneses of the functional and organic types are essentially different.

3. As pointed out by Robson (Keen's Surgery), volvulus or torsion of the stomach is a condition in itself and should be treated as such.

4. Many cases follow operations for appendicitis and other abdominal conditions which are not diagnosed, but improperly attributed to shock, ileus, intestinal obstruction, and the like.

5. Mild cases may, and undoubtedly do recover at times spontaneously. In most instances, however, untreated cases rapidly prove fatal.

6. Early and repeated gastric lavage will save the majority of cases. In well developed cases at least one trial lavage should be given where the first return of the gastric content is clear before the washing is discontinued.

7. The posture treatment should not be forgotten. Cases may be saved by this procedure where other measures fail.

8. Surgery is not indicated except where there are definite signs of obstruction, in which cases naturally lavage and posture fail. An offensive or feculent odor of the vomitus or gastric content is not in itself prime evidence of an obstruction.

CASE REPORTS

CASE 1. Acute dilatation of stomach following ingestion of foreign matter. C. O., age 5, Aug. 19, 1910.

This case occurred under the most extraordinary circumstances. At about 7 p. m., the boy, who before that time had been playing in front of the house, suddenly disappeared. His mother, together with a visiting neighbor, went to search for him. They found him head first in a latrine in the rear of the house. Whether he had gone there to vomit or under what circumstances he had met with this accident, I was unable to learn. He was taken out and brought into the house in an unconscious condition. At the time of my arrival he was deeply cyanosed, respiration shallow and irregular, pulse barely perceptible. His abdomen was distended to an extreme degree. Few ounces of frothy, offensive fluid druled from the mouth. It was apparent that he had swallowed quantities of foreign toxic matter. I passed a stomach tube and immediately relieved him of large volumes of gas, and in the washings, quantities of most nauseating putrified fecal material. By the time I was through with the lavage, his consciousness began to return, his general condition markedly improved, and the size of the abdomen was down to practically normal. Except for a slight rise in temperature the following day and a moderate diarrhea, which persisted for a few days, recovery was rapid and uneventful.

Comment: This case is illustrative of the type occurring after the ingestion of large quantities of food or foreign material. In this instance possibly there was a swallowing of air together with quantities of toxic matter.

CASE 2. Acute dilatation of stomach with-

out apparent cause. Mr. C., male, age 48.

Suddenly after retiring about 11 p. m. began to eomplain of extreme distress in the upper abdomen. On my arrival I found the patient leaning baek in a Morris chair. He eomplained of great distress and said he eould neither sit up nor lie down; his abdomen was greatly distended and tympanitie, especially to the left of the median line. Respiration was impeded and pulse small and irregular. Though not particullarly nauseated, he suggested that if he eould only vomit he thought he would be relieved. I suggested a stomach wash of which he approved. Immediately he was relieved of quantities of gas and a thin serous, greenish, odorless fluid. Reeovery was prompt. He passed a good night, and except for a slight soreness of the upper abdomen, the patient was well the following day.

Comment: In this ease no known factor responsible for precipitation of the attack eould be traeed. In a reeent eonversation with him, he informed me that he has had two similar attaeks, but much milder. In each instance he was able to relieve himself by indueing vomiting.

CASE 3. Acute dilatation of stomaeh following eholecystotomy for cholelithiasis. Mrs. S., age 54, Feb. 4, 1911.

This patient was a woman of small statue, rather lean, but otherwise in fairly good physieal eondition. For the past 7 or 8 years she had suffered from repeated attaeks of pain in the upper abdomen, of varying intensity and duration. She had never been jaundiced. Except for a moderate tenderness in the region of the gall bladder, physical examination was rather negative.

Operation (Ether anesthesia). Right reetus ineision. The gall bladder was imbedded in an extensive mass of adhesions rather diffieult to separate. After having accomplished this, the gall bladder was opened and a number of pea sized stones removed. No stones were palpable in either of the duets. The pyloric end of the stomaeh was rather fixed, on account of extensive adhesions in this region. Appendix abont normal and not removed. Tube drain inserted, wound sutured, and patient returned to her room in good eondition.

Proetoelysis was administered from the start. Afternoon passed without anything of note. Evening, T. 98.3, pulse 84, respiration not recorded.

Feb. 5. Patient had not slept mueh but rested fairly well. Morning, T. 98, pulse 84. During the day she took some water and liquid nourishment. Evening, T. 98 3/5, pulse 80. Resting well.

Feb. 6th, at 2:30 a. m. The reeord shows patient beeame extremely restless; she eomplained of pain in the abdomen and there was great distention. Pulse 120, respiration 50, reetal temperature 101.2. A Nobles enema was given with good results and some flatus expelled. At 5:30 a. m. pulse 120, respiration 46, rectal temperature 100 1/5. There was no vomiting, the abdominal distention eontinued, and the patient died in a state of eollapse at 9:30 a. m.

Comment: Unfortunately, a diagnosis was not made in this ease until the patient was moribund. No post mortem examination eould be obtained. This ease is illustrative of a well defined post operative type, which, when untreated, rapidly prove fatal.

CASE 4. Aeute dilatation of stomaeh following eholeeystotomy for eholelithiasis and suspension of uterus. Mrs. B, age 38. June 11, 1913.

Patient of average size and build. She had complained of dyspetic symptoms about 6 years. At no time had there been a elear eut attaek of gall stone eolie. Symptoms of hyperaeidity and a vague distress in the upper abdomen were the ehief eomplaints. Examination: Color and nutrition good, chest negative; moderate tenderness in right epigastric region and at McBurney's point. Pelvie examination showed a marked retroversion of the uterus; exeessive hypertrophy of the eervix, and extensive laeeration of the perineum.

A two-stages operation was deeided upon: First, laparotomy, for cholilithiasis with shortening of the round ligaments. Second, perineal for the purpose of amputation of the eervix and repair of the perineum.

First Operation (Ether anesthesia). Right rectus ineision. Gall bladder opened and three large stones removed; tube inserted for drain and incision elosed. A median ineision was made from the umbilicus to the pubie bone. A

chronic appendix removed and a Baldy-Webster operation for shortening of round ligaments done. The abdomen was closed. The patient was returned to her room in good condition.

There was nothing uuusual to note during the first two days. Pulse and temperature normal. There was no post operative vomiting. On the second day, she had in addition to water, 2 ounces of buttermilk, and later 4 ounces of chicken broth.

Suddenly at noon on the third day, she began to vomit. First at 1:20 p. m. a moderate amount of brownish fluid, then at 3:20 and at 4:15 p. m. a large amount, and after that frequent raising of small quantities, until at 5:30 when I saw her she was very restless and distressed from a marked distention of the abdomen. The nurse was required to hold a basin in front of her mouth almost continuously, as every few moments, almost without warning, she would raise a few mouthfuls of thin dark brown fluid. Her temperature at this time was 97.4, pulse 84, respiration 24. Her pulse was feeble but not excessively rapid for this type of case. I decided at once to begin the use of the stomach tube. Immediate temporary relief was obtained. I was not aware of the benefits to be derived from systematic lavages at frequent intervals at this time, hence the washings were given only as seemed to be indicated after the first treatment. After 5 or 6 lavages, continued over a period of 48 hours, this patient made an uneventful recovery.

Comment: This was another rather typical post operative case, arising without any apparent cause. On Nov. 8, 1913, her perineal operation was done; cervix amputated, cystocele obliterated and perineum repaired. Following this operation, there were no post operative complications.

CASE 5. Acute dilatation of stomach following operation for acute perforative appendicitis with general peritonitis. Miss R. C., age 18. Sept. 12, 1915.

When I saw this patient she gave a history of having been ill with a pain in the right side of the abdomen during the past 6 days, rather bad for 3 days, but only severe for one day. Temperature 102, pulse 100. On examination, there was general abdominal rigidity, most marked over McBurney's point. A diagnosis of general peritonitis was made and an operation was advised.

Operation. A right rectus incision was made; a general peritonitis was found. The appendix was gangrenous at the distal end; at the middle there was a perforation at the site of a fecal concretion. The appendix was removed. A large tube was placed so as a drain the posterior cul-de-sac, and another to drain the lumbar fossa. The wound was sutured and patient returned to her room.

The patient was placed in Fowler's position and proctoclysis ordered. She had emesis three times during the first night; first, of a light green color, then changing to a dark green. Morning of first day. Temperature 98.4, pulse 114, respiration 30. Nothing out of the ordinary took place during the day. Evening temperature, rectal 101 F, mouth 97.6, pulse 102, respiration 28.

Morning of second day. Temperature 98.4, pulse 102, respiration 22. Had had one large stool and several small ones. Had taken some hot water and small amounts of orange juice; about midnight had vomited 3 ounces of green fluid; slept at short intervals. During the day she had another large stool, and again vomited about 4 ounces of green fluid. Evening temperature 97.6, pulse 96, respiration 22.

Except that the patient had a moderate diarrhoea, i. e. passing 4 or 5 stools per day, nothing out of the ordinary took place the following two days. Temperature about normal and pulse ranging about 100.

On the fifth day, her abdomen became distended and she complained of being distressed but did not vomit. A lavage was ordered. The returns showed some undigested particles of food. A temporary relief was obtained, but again during the night she had emesis of 1 ounce, and at 3:30 a. m., 16 ounces of fluid of an offensive odor and brown color. After this, gastric lavage was ordered to be given every 4 hours. Rectal feeding was instituted and protoclysis continued. The lavages were continued for 48 hours before the first returns of the gastric contents were clear. At nearly every lavage the contents had a decided feculent odor, which was very offensive in character. At no time during this period did her

temperature rise above normal. After the gastric symptoms subsided, however, there was an evening rise of one to two degrees for a few days. The pulse, however, receded and approximated the normal.

After the washings returned clear from two trial lavages, feeding by mouth was begun, and convalescence was uninterrupted.

Comment: To my mind this case represents one of the post operative types of a toxic origin, which though in many instances not recognized, are not infrequent during the course of peritonitis—general or local.

CASE 6. Volvulus or Torsion of Stomach. Mr. M. (Referred by Dr. Thos. Gratzek) Boilermaker, age 54. Feb. 16, 1916.

While at work drank considerable water; began to feel pain in stomach which rapidly became severe; could not go home unassisted. Was nauseated but could not vomit. Had eaten some oranges at noon; bowels had moved same morning. Was seen by Dr. Gratzek at 11 p. m.; temperature 99, pulse 110. Tenderness, marked rigidity in upper abdomen.

Feb. 7, 7 a. m. Very marked distension in upper abdomen, marked rigidity and tenderness; could not pass stomach tube. Was sent to Bethesda Hospital where I was asked to see him. At this time he was in great pain, nauseated, but could not vomit. On examination found same condition present,—namely, extreme distention in upper abdomen, lower abdomen retracted. Again an attempt to pass stomach tube was unsuccessful. At 2 p. m. he was sent to the operating room and prepared for operation. After he was completely anesthetized, another unsuccessful attempt at passing the stomach tube was made. An incision was made in the upper abdomen, through the rectus, slightly to the left of the median line. Stomach was found to be extremely dilatated. A purse string suture was placed, and within the circle a large troear was inserted. A large amount of gas was emitted, with small amount of dark fluid and particles of food. Trocar was withdrawn and purse string tightened and tied.

An interesting point was that when purse string suture was cut and stomach allowed to drop back, we were unable to again locate point at where same had been placed, indicating that a great deal of rotation had taken place.

The abdomen was closed. Stomach tube could now be passed without difficulty. The patient made an uneventful recovery, and has been in good health since that time.

Comment: This case represents a type clearly due to mechanical causes, and while the symptoms produced are much the same as in the functional cases, the condition is essentially different and requires operative means for relief.

CASE 7. Acute dilatation of stomach following operation for acute perforative appendicitis with general peritonitis. Mr. F. V., age 45. Merchant. This patient gave a history of having been ill two days. Onset sudden, with colicky pains, some vomiting, but no movement of the bowels except by enema. Temperature 99, pulse 64, respiration 18.

On examination there was a moderate distention of the abdomen; no rigidity to speak of, but some tenderness slightly to the right and just below the umbilicus.

Owing to the uncertainty of correct diagnosis in this case a median incision was made from the navel down. A general peritonitis was present; the appendix was ruptured and partly buried in a tuft of omentum. The distal end was partly gangrenous. The appendix, with the affected portion of omentum was removed. A large drain was placed in the pelvis and the wound sutured.

On the first day the patient had emesis of clear, watery fluid, following the operation. A quart of rectal salines was retained during the afternoon. Evening temperature 99.5, pulse 80, respiration 22. He had a fairly good night and passed the following day as well as the average case.

On the second day there was more distention of the abdomen than there had been before. During the day as enema was given, but no relief was obtained from this. Gastric lavage was ordered. The contents of the stomach returned greenish in color. Evening temperature 98.6, pulse 84, respiration 24.

Third day. A fair night was recorded; pulse and temperature about the same; but abdominal distention and distress continued. Gastric lavage was given and ordered to be continued

every four hours until the first returns would be clear. The character of the conents is described on the chart as a brownish green and a greenish yellow, and yellow with bile. During the day he had a large liquid stool. Evening temperature registered 98.8, pulse 76, respiration 22.

After three washings had been given the returns were practically without color and the lavages were discontinued. The patient did well until the evening of the following (4th) day, when he again vomited 17 ounces of brown fluid at one time, and about an hour later, 2 ounces. Again gastric lavage was begun and kept up every four hours. Except at certain times when the patient was asleep, this was kept up for two and a half days. At the end of that time the washings began to return clear and were ordered discontinued. During this period his temperature and pulse remained normal; bowels moved quite naturally, proctoclysis and nutrient enemas were given.

On two occasions during the following 4 or 5 days, he became distressed and required a lavage, but the return fluid was practically colorless in each case. Feeding was gradually resumed and the patient went home well on the 18th day after the operation.

Comment: This case illustrates another of the toxic post-operative types of gastric paralysis. Without the persistent use of the stomach tube conditions would undoubtedly have proved fatal.

CASE 8. Acute dilatation of stomach following oophorectomy for ovarian cyst. Mrs. A. G. H., age 73. This patient was of slender build; nutrition rather below normal, but otherwise in fair physical condition. She complained of a gradual enlargement of the lower abdomen, which had been noted during the previous six months. She also complained of dyspeptic symptoms and of a vague pelvic pain. On physical examination a well defined pelvic tumor was palpable in the lower abdomen.

Nov. 21, 1919. Patient was operated upon under ether anesthesia. An ovarian cyst about the size of a man's head was removed. No difficulty was encountered at the operation, and the removal of the tumor consumed but a short time.

After the completion of the operation, the patient was returned to her room and passed a fairly comfortable day. Nothing unusual was noted in her convalesence until the morning of the third day. At 4:30 a. m. she had emesis of a moderate amount of yellowish fluid. The evening temperature on the day before was 98, pulse 75, respiration 20.

Third day. On the morning of the third day, when vomiting first took place, she had a temperature of 99, pulse 75, respiration 46. Her abdomen was rather distended; she complained of gas pains but appeared to be relieved by the passage of a rectal tube and a saline enema. Food was withheld; protoclysis had been given from the beginning and was continued. Evening temperature 98.6, pulse 78, respiration 18.

Fourth day. Though nauseated at times, had spent a fairly good night. Temperature 98.6, pulse 78, respiration 18. Abdomen showed rather marked distention. During the day she vomited five times, the quantity varying from 4 to 8 ounces, the fluid being dark brown, and on one occasion greenish fluid with some undigested food. Evening temperature 98, pulse 75, respiration 20.

Fifth day. A fairly good night reported; no vomiting; bowels moved with an enema. Temperature 98.2, pulse 76, respiration 36. Abdomen greatly distended, especially to the left. Patient began to show signs of exhaustion; eyes sunken, and yellow waxy complexion. Gastric lavage was given. A rather large quantity of brown fluid was removed and a quantity of gas expelled through the tube. The gastric contents had a decided offensive odor. Chemical analysis showed the absence of free hydrocholoric acid but gave reactions for bile and blood.

After two subsequent lavages at intervals of 4 hours the patient made an uneventful recovery.

Comment: This case represents a type of acute dilatation in which it is thought the cause is due to the sinking down of the intestines in an empty space, produced by the removal of a tumor, and thus causing traction on the root of the mesentery and thereby a compression of the horizontal portion of the duodenum.

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PRE-ECLAMPTIC TOXEMIA AND POST PARTUM ECLAMPSIA*

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A recent experience with the following case of Post-partum eclampsia left a tragic impression. From the onset the condition seemed to have been utterly unavoidable and also irresistible in its progress.

Mrs. P., age 23 second pregnancy. Family history negative. Personal history; no acute illness or infection. First pregnancy about two years ago was normal resulting in spontaneous labor and a healthy child. The present pregnancy was uneventful with no excessive vomiting or evidence of toxemia. The patient had been under the care of another physican and recent urine examinations had been reported negative. She had been in usual good health up to the onset of labor which occured at term in the early morning of Jan. 27, 1920. Being unable to reach her own physician I was called and arrived at the termination of a normal spontaneous labor. The baby was at full term, living and healthy in every respect. The placenta was expelled spontaneously and was normal. Bleeding seemed somewhat excessive so a hypodermic injection of Burrows-Welleome "Ergotoxine" was given, resulting in a prompt reaction. The patient was left in good general condition at 8 A. M. She complained of slight distress aeross upper abdomen, but as this was not severe and there was no nausea, it did not attract the attention to which it was, perhaps entitled. At noon I was called to the house and found her comatose, with a history of several convulsions. She was somewhat cyanotic, with edema of the face but none of the extremities, her breathing stertorous. She was given ½ grain of morphine and prepared for removal to the hospital, during which time there were several severe general convulsions. On arrival at St. Mary's hospital the patient was put in a hot pack, morphine repeated and Chloral hydrate given per rectum. During the next hour there was a general convulsion about every 20 minutes, with deep coma and stertorous breathing in the intervals. At 5 P. M. temperature was 101, pulse 100, full and bounding. Blood-pressure 140-90 marked cyanosis, some edema of the face but none of the extremities. Fifteen ounces of bloody urine were obtained by catheterization, and showed only a trace of albumen and a few casts. A pint of saline was given by hypodermoclysis and continuous proctoclysis started. Without my orders chloroform had been used during the convulsions, but ether was substituted and proved equally effieient. At 10 P. M. the condition was much the same, convulsions every 20 minutes, with deep coma, stertorous breathing, marked cyanosis, and blood-pressure 140/80. 400 Cc. of blood was taken from the vein and other measures continued, followed by cessation of the convulsions, and improvement in color though she remained comatose and at no time regained consciousness. Jan. 28, 9 A. M. temperature 106, pulse 140 and weak. Cold packs and sponges seemed to control the temperature for a time but there was no response to active stimulation. Twenty ounces of rather bloody urine were obtained during the day. The patient grew progressively worse and died at 8 P. M. just 36 hours after delivery.

A partial autopsy was permitted and took place the next morning. Face somewhat bloated but there was no general edema and none in the ankles. The abdomen contained a small amount of clear fluid, and the intestines were moderately distended with gas. The uterus was firmly contracted and of usual size. Liver,

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enlarged, extending below the costal margin, was pale yellow and mottled with numerous hemorrhagic areas scattered over the surface. On microscopic section it gave characteristic picture with areas of necrosis about the portal veins in the lobule. The kidneys were perhaps a little enlarged and markedly congested, and the pelves contained considerable bloody urine. Capsules stripped easily and, on section, the anatomical markings stood out beautifully. Microscopical study showed normal glomeruli, congested convoluted tubules with pale cells, and the lumens contained much detritus.

There is at present, too great a tendency to class all convulsive seizures occurring late in pregnancy and during or following labor, as eclampsia. Many of them are in fact uremic rather than eclamptic. We may group such late toxemias with convulsions under three headings.

1. Uremic convulsions, characterized by high blood-pressure, edema, decreased output of urine, and findings pointing to nephritis. These are usually preceded by premonitory symptoms commonly described as "preeclamptic toxemia." At autopsy there is evidence of some type of nephritis while other findings are variable.

2. Eclamptic or hepatic toxemia, characterized only by convulsions, coma, and at autopsy by certain definite changes in the liver. Blood pressure is normal or only slightly elevated. The urinary findings may be negative, or present evidence of sudden irritation with decreased amount of urine of high specific gravity, hematuria, albumen and casts. In eclampsia per se, there are no recognized warnings or definite preeclamptic symptoms or signs. At autopsy in these cases the only constant and typical findings are in the liver, others being more or less incidental.

3. Hepatic or eclamptic toxemia may develop in women whose kidneys are already defective and be superimposed upon an early nephritic toxemia, in which case there will be a more or less definite pre-toxic stage with high blood-pressure, odema, eye symptoms, and urinary findings. Autopsy will demonstrate lesions in both the kidneys and liver.

One is impressed with the fact that eclampsia may and often does occur in women who are under good observation and in whom there is no warning evidence to be obtained in the blood-pressure, urine, or the ordinary pre-natal examination. For instance, a personal communication from Dr. J. W. Harris, Resident Obstetrician at The Johns Hopkins Hospital, describes three cases which occurred recently in women who had been under regular observation and who presented none of the pretoxic signs. One of these patients had nineteen convulsions, another eleven, and the third had five convulsions following a normal spontaneous labor. The highest blood-pressure in these cases were: 108/70. 120/85. 150/90. and in but one was there enough albumen to be measured by the Esbach reagent, that showing only a trace. These women were treated for the toxemia only and all recovered.

Some patients do show more or less definite evidence of "preeclamptic toxemia," most of the findings of which point to renal deficiency rather than to liver toxemia. The condition may be said to be preuremic and not preeclamptic. One is forced to the conclusion that the urinary findings preceding or during eclampsia are somewhat incidental, unless there be organic changes in the kidneys in which case it is difficult to say that the entire condition is not uremic. In fact, in the absence of autopsy findings, the differential diagnosis between eclampsia and uremia is by no means definite or simple. We must therefore conclude that many of the attacks classed as eclamptic are in truth, uremic. In some of the cases of eclampsia which occur "Like a flash from a clear sky" with no pretoxic symptoms, there is a sudden partial or complete anuria, hematuria, with albumen or casts, in other words an overwhelming of the kidneys by toxic substances being excreted, may we assume as a result of the hepatic lesions. It is also apparent that the usual preeclamptic findings will be most evident in women whose kidneys are already defective. Therefor in such cases the condition is more likely to present premonitory evidence in the pretoxic stage so that treatment may be instituted at an earlier period with better prospect of success, whether the impending attack be uremic or eclamptic.

From a purely scientific standpoint it would

seem that elinieal and chemical researeh on eelampsia should be limited to those eases which show a minimum of signs of renal disturbance. It is to be hoped that such work may develop some more early definite evidence of liver deficiency whieh may be eonsidered as truly preeclamptic. For the present however we must aeeept the term eelampsia at its face value, though eertain that it ineludes many cases of uremia with no hepatic or eclamptic toxemia.

Aside from the elinieal and patholigieal evidenee, there are a number of facts which suggest that eelampsia develops under conditions rather different from those predisposing to renal toxemia and uremia. Personal observation and conversation with obstetricians convince me that a large proportion of these cases oecur during the winter months when the women are taking less exercise especially out of doors. Gessner (Centralblatt fur Gyn. Vol. 53. No. 50.) notes that in the province of Baden for six years preceding the war, eelampsia occurred in from 1.5 to 2 instances in 1,000 confinements, but fell to 0.8 per 1,000 during the war. Also, at the Hanover Maternity the number of cases fell from : 25 in 1914 to 23 in 1915, 13 in 1916, 10 in 1917, and 7 in 1918. He ascribes this to the fact that women were working harder and taking more exereise rather than to restrictions in diet. If diet, i. e. protein and fat were important causal factors, eows whose diet is entirely vegetable should not have eelampsia. He explains this eondition in eows as due to a lazy phlegmatic life, ineomplete oxidation, and aeeumulation of fat in the tissues. He also describes a fat anemic type of woman what is predisposed to eclampsia and suggests the possible prophylaetic value of thyroid and pituitary extracts.

Shears, in his interesting book (Obstetries, Normal and Operative) lays much stress on incomplete oxidation in the tissues due to faulty hygiene and laek of exercise in the fresh air. His ideas are extremely suggestive.

We assume that the eondition is due to the retention within the maternal organism of eertain abnormal produets of metabolism. These give rise to definite degenerations in the liver and later to convulsions, coma, and only seeondarily to ehanges in the kidney. There may be either: A. Overproduction of such materials from one of two sources; 1. The product of conception. On this assumption we have to explain the faet that the eonvulsions and toxemia may be controlled and the pregnaney eontinue. Williams (textbook of Obstetrics) quotes Lichtenstein who collected 120 such cases of which 56 gave birth to dead fetuses and 64 to normal babies at full term.. We have also to explain the post-partum type of eclampsia. 2. The toxie products may be produced in the maternal organism by ehange of habits, laek of fresh air, and to diet, though this latter is not often mueh ehanged. B. There may be a true retention of sueh substances with incomplete oxidation and elimination due in great part to ehange of habits.

On the basis of sueh reasoning we must conclude.

1. Prenatal care should include supervision of hygiene and our patients must be taught the value of regular exereise and fresh air.

2. Blood-pressure and urine examinations as commonly carried out are most important in detecting early evidenee of renal deficieney, but are not sufficient to give warning of impending eelampsia at least in the uncomplieated eases. For this information we shall have to await further researeh.

3. In view of the faet that pregnaney as such plays a more or less indireet role in the etiology, we should direct our first efforts to overeome the toxemia. This will include: eontrol of convulsions by morphine, chloral and ether; elimination by sweating, hot packs, but most rapidly and efficiently by bleeding. Excessive dehydration must be avoided by fluids administration by rectum, subeutaneously, or intravenously. A reeent article by Titus (J. A. M. A. Vol. 74 No. 12 p. 777) is most suggestive and establishes a logical reasoning for intensive administration of sodium biearbonate, glueose, and carbohydrates in these eases. Radical termination of pregnancy should be undertaken only in speeial circumstances, and then with a keen appreciation of the diffieulties and risks of rapid surgieal delivery.

THE MECHANICS OF DIGESTION.*

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Two main factors are concerned in digestion, chemical and mechanical. The chemical factor, studied and analyzed for many years, was the first source of our knowledge of digestion but apparently, in spite of all the recent advance in fractional gastric analysis, it has reached almost its height as a source of information of digestive function.

The mechanical factor on the other hand has, until the last few years, been but little studied, although a search of the literature of over a quarter of a century reveals numerous isolated observations on the mechanical activities of the digestive tract as studied in the animals.

Hess[1], in 1886 and 1887, published some interesting experiments on the varying degrees of tonus in different portions of the intestinal canal. By an ingenious method he noted that the downward pull of a balloon in the intestine was greatest near the pylorus, decreasing as the balloon progressed towards the ileum.

Other observers noted differences in the muscular thickness as well as differences in sensitiveness to stimuli in different parts of the intestinal tract.

In 1898 Bayless and Starling[2] formulated their law of the intestine, namely, "that excitation at any point in the gut causes contraction above and inhibition below".

A little over a decade ago Cannon[3], of Boston, commenced his experiments utilizing the X-ray, just beginning to become popular, instead of the fistulous animals previously used. He fed his animals food mixed with bismuth, watching the movements of this opaque mass through the entire length of the gastro-intestinal tract by means of the fluoroscope. The animals were quickly accustomed to laboratory procedures so that the observations were made under relatively normal conditions.

Cannon's first work was directed to a study of the importance of tonus in gastro-intestinal motility and the relation of the vagus nerves to it. Having cut the vagus nerve supply to the esophagus, he noted that there was an immedate paralysis, the esophagus ballooning out under pressure of the bismuth column without forcing it ahead into the stomach. Continuous observations, however, showed that after twenty-four hours recovery commenced to take place, tonus returned, and soon the esophagus was forcing food into the stomach apparently as well as before. Furthermore, he noted that, in the early stages, if the amount of bismuth introduced into the esophagus was small, no movement took place, but if the amount of bismuth was large, so that the walls of the esophagus were greatly distended, some of the bismuth was forced through the cardia, a small amount remaining however, which did not move.

By this experiment he demonstrated first, that the esophageal wall has within itself an inherent tonicity, and secondly, that distention is an important factor in exciting activity of the esophagus.

These experiments of vagus section were repeated on the stomach, small intestine, and later on the colon. In each case the severing of the nerve supply was followed by temporary paralysis with resumption later on of normal function, independent of the central nervous system. Severing of the sympathetic nerve supply to the gastro-intestinal tract did not alter tonus or cause temporary paralysis. Apparently the vagus increases tonus and the sympathetic relaxes tonus, and the balance between these two keeps up a proper state of tonus in the gastro-intestinal tract.

If, instead of cutting the vagus, it was stimulated, an increase of tonus was noted. Just when this tonus acts normally, without stimulation, is hard to say, but since increase of tonus causes peristalsis to appear and cutting the vagi before food is eaten causes no peristalsis, there must be a setting of tonus along with psychic secretion (as shown by Pavlov[4]) with the sight, smell and the eating of food. "After digestion is well started the vagi can be cut without altering either the nature of peristalsis or rate of gastric emptying." In some way the tonic state maintains itself.

In another series of experiments on dogs the abdomen was opened under warm normal saline and a soft mushy mass injected into the empty stomach. At these operations the stomach was not always found to be in the same condition.

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Sometimes it was large, atonic and flabby and seemed to give way before the injected mass without any reaction whatever. At other times the stomach was small and contracted, and, as soon as the soft mass was injected, began to act on it with peristaltic contractions.

Here again we see the importance of tonus in its relation to motility, and by tonus Cannon means that the muscle is shortened and resilient.

Observing the progress of food through the colon, he noted the presence of a pulsating constriction ring near the ileocecal valve. This had been referred to by previous writers, but, according to Cannon, its importance had not been realized. He noted that with each pulsation of this constriction ring a wave passed down the canal.

Furthermore, he observed that if, while these waves were running along the canal, the liquid contents were almost entirely withdrawn, these waves ceased, but reappeared as soon as the fluid was reintroduced into the canal in sufficient amount to cause distention. Again we see the importance of distention as a factor in gastro-intestinal motility. If the stretching be too great peristalsis is just as promptly stopped as if the stretching be insufficient.

In further analyzing this pulsating ring we go back to the well known principle of physiologists that a muscle stimulated and responding by contraction is refractory to further stimuli during all the stage of contraction and during the first part of the stage of relaxation. It is only during the latter part of the stage of relaxation that it is again susceptible to stimulation. Consequently, if we have a constriction ring and the right degree of stretching as a source of stimuli, then as long as this stretching lasts we are going to have pulsations of this constriction ring and, from the above explanation, it must act rhythmically because the ring is not open to stimuli during its refractory period. Consequently we have added the explanation of the third factor in gastro-intestinal motility, namely, rhythmicity.

We have then three factors necessary for normal gastro-intestinal motility—tonicity of the wall, the necessary degree of stretching of this tonic wall, and the rhythmic contractions due to this stretching.

In further studies Cannon found that this pulsating tonic ring could be made to appear anywhere in the colon by pinching the wall or by applying a weak solution of barium (which raises muscle tonus). This ring would send downward running waves and if, at the end of these waves, the colon was again stimulated by pinching, reverse waves could be started which blocked the oncoming waves. If the colon were stimulated in the middle, waves might be seen running in either direction.

Factors Varying Tonus.—Putting of food into the stomach raises its tonus above that of the intestine and peristaltic waves start carrying the food towards the pylorus, but if the entire tract be watched for a number of hours under the fluoroscope, it will be noted that while the stomach may empty to a certain point quite rapidly, there comes a period when the food will lie for some time without moving. This may be explained on the ground that food in the stomach has raised its tone above that of the intestine. When a certain amount of food has entered the intestine the tone of the intestine is likewise elevated and may be equal to that of the stomach, consequently no movement can take place until either more food is put into the stomach or movement takes place lower down in the intestinal canal.

We must regard the entire gastro-intestinal tract as a unit and realize that, though separated by many feet of small intestine, the stomach and cecum are in reality very close together through their nerve supply and that what goes on in one part is reflected by the other.

"Roith[6] describes two cases in which rectal injections brought about movements in the upper colon although the bowel in between had been completely severed."

Alvarez[7] noted on graphic records ripples running from pylorus to cecum in a few seconds. Roentgenologists have observed that putting food into the stomach sometimes causes material to pass through the ileo-cecal valve or rush through the colon.

Some individuals experience a desire to go to stool immediately after meals. One of my cases had to go to stool immediately if he ate strawberry jam with his meal.

The character of the food taken likewise has its effect on tonus. Patients who have vomited liquids repeatedly, may cease to vomit if given

solid food. This is often true in post-operative cases where, as will be shown later, the trauma of the operation may have elevated intestinal tone. Apparently the solid food raises gastric tone sufficiently to overcome the reverse peristalsis and set the current running downward again.

Pleasurable psychic stimuli likewise have a tonus-raising power. This is seen in the activity of the stomach of a hungry dog on the taking of food, while Haudik and Steiler[8] noted slow gastric emptying when food is taken without appetite.

Effect of Irritating Lesions.—Any irritating lesion in any part of the intestinal tract will raise the tonus of that portion above the normal, will retard the current coming towards it, and hasten the current going from it. If there is any lesion in the region of the ileo-cecal valve, such as chronic appendicitis or adhesions, it will raise the tonus of this portion of the gut above normal and prevent the normal progress of the food through the small intestine, raising the tonus backward all along the line and bringing about a slow gastric emptying referred to above.

Smithies[9] says "of 482 cases of gastric stasis due to ascending influences only 21 showed retention after removal of appendices or restoration of natural conditions in the bile tract".

Aaron[10] in fluoroscoping a case of chronic appendicitis noted that pressure over McBurney's point caused epigastric pain and pylorospasm.

These clinical observations were substantiated by experiments of Hedbloom and Cannon[11]. They irritated the cecums of cats with croton oil and found that on the following day the animal's stomach emptied very slowly in spite of active gastric peristalsis, and that there was great slowing of the current in the small intestine as well.

In the above experiment, apparently the local raising of tonus in the gut wall, following injury, has a protective effect on the injured gut in not allowing material to come near it. Cannon and Murphy[12] noted that directly after high intestinal section and suture, while gastric peristalsis was not interfered with, the pylorus remained tightly closed for almost 6 hours after recovery from anesthesia and did not permit food to pass into the injured gut. He comments on the coincidence between this period of delay and the time required for the primary healing of the intestinal wounds. Undoubtedly some of the socalled post-operative ileus may be due to trauma of the gut during operation and is Nature's way of protecting the canal until the acute results of injury have subsided.

In some individuals frequent feedings do not work well because, in spite of the increased tonus due to the repeated putting of food into the stomach, the tone of the colon is so high that the food does not move along and consequently the stomach does not empty properly. These people will often regurgitate food or vomit from these frequent feedings. If, however, in these cases the current through the colon can be speeded they will take care of the increased number of feedings with great benefit. This is more likely to occur where something has raised the tonus of the colon, such as adhesions around the cecum and lesions around the rectum and anus.

Roentgenologists frequently attest the fact that any irritating lesion in the region of the pylorus will speed the current through the entire canal; some of them going so far as to say that the presence of the head of the bismuth column in the descending colon within six hours is pathognomonic of a lesion in the region of the duodenum such as chronic gall bladder, pericholecystitic adhesions, or pancreatic disease.

So much for irritating lesions and food in the upper portion of the tract. We have seen how the putting of food into the stomach raises its tonus above that of the intestine. We may likewise see how the putting of food into the rectum will raise its tonus above normal. This has been frequently observed in attempts at rectal feeding. The tonus of the descending colon may be so elevated above normal that reverse peristaltic waves may be started and cramps, nausea and even vomiting ensue.

Rolliston and Jex-Blake[13] out of 96 cases collected from the literature of gastric ulcer fed by rectum alone found that nausea, colic or vomiting occurred in 26 (about 25 per cent) and in most of these 26 cases even colonic flushing caused nausea.

Of irritating lesions in the region of the rectum, hemorrhoids and fissures are the most common. These elevate the tonus of the descending

colon so that the feces are held back out of the ampulla of the rectum and even gas does not easily pass out through the rectum but accumulates at the splenic flexure. Alvarez says "this is so constant a finding that I have come to regard a large tympanitic Traube's space as almost diagnostic of hemorrhoids."

Case[14] of Battle Creek believes he has demonstrated roentgenologically that adhesions of the pelvic colon, where it crosses the left psoas and dips into the true pelvis, are a source of chronic constipation in many women because they prevent the ampulla of the rectum from filling normally and thus the rectal stimulus for stool is absent. I believe that both factors, namely, adhesions of the pelvic colon and irritating lesions around the rectum, may be responsible for constipation in many individuals.

Soper[15] speaks about the relief of constipation in a large proportion of his patients from the use of local applications to the rectum and sigmoid through the proctoscope of a saturated solution of magnesium sulphate which relaxes muscular spasm.

There is still a condition which has not been adquately understood, commonly known as spastic constipation, manifested symptomatically by alternating attacks of constipation and diarrhoea, by frequent passage of narrow flat ribbon-like stools and occasional attacks of intense left-sided colic relieved shortly by the taking of a slowly given, intensely hot enema or a hypodermic of morphine. In these cases the descending colon may be palpated as a narrow, finger-like cord in the left flank and fluoroscopy reveals a small narrow descending colon and sometimes a transverse colon without the usual haustral segemental markings. This condition sometimes seems to follow great nervous strain, mental anxiety and the frequent taking of irritating cathartics to relieve chronic constipation.

Alvarez [16] has shown so well how this latter condition may occur by his experimental studies on the purging of rabbits. These animals were given doses of the usual irritating cathartics such as castor oil, jalep, magnesium sulphate, etc., proportional to their body weight, and their colons were removed at autopsy 21 hours later. In some cases the descending colon was found contracted to a hard white cord with a very narrow lumen; in other cases the colon was atonic and flabby, was filled with a watery fluid, and the mucosa inflamed and congested with small ecchymotic hemorrhages scattered throughout. Excised segments in Ringer's solution showed weak and irregular contractions and were less sensitive to drugs applied locally.

CONCLUSIONS

To recapitulate: To have an edequate understanding of the mechanical factors concerned in digestion we must think of the gastro-intestinal tract as a unit from mouth to anus, realizing that what goes on in one portion of the tract may be reflected in the activity of another portion quite remote from it; that the progress of food is conditioned on the state of muscular tonus of the walls of this tube; that, given a state of tonus, a requisite amount of distention is essential to bring out intestinal activity; and that, given distention, rhythmical waves will ensue; that variations in the normal progress may occur, due to abnormal elevation of tonus through irritating lesions; and that the whole progress is dependent upon a balancing of forces between one portion of the tract and another; that the vagus nerves send tonic impulses to the entire tract as far as the middle portion of the colon, while fibres to the descending colon and rectum come from the 2nd to 4th sacral nerves, but that the tract has apparently an inherent capacity within itself of maintaining tonus; that irritating lesions in the region of the rectum will raise the tonus of this portion above normal and slow a current coming towards it and even bring about nausea and vomiting; and that lesions around the cecum act in a similar manner.

"Briefly, gastro-intestinal symptoms are motor symptoms that arise when normal progress of food is disturbed, namely, speeding, slowing, stoppage and reversal."[17] If one can once grasp these ideas of the alimentary canal, many of those obscure problems that have baffled explanation in the past will be made clear and treatment directed along these lines will yield surprisingly satisfactory results.

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6. Roith: (Quoted, by Alvarez), Jour. A. M. A. July 31, 1915, p. 389.
7. Alvarez: Jour. A. M. A. July 31, 1915, p. 388.
8. Haudik & Steiler: (Quoted by Alvarez), Jour. A. M. A., July 31, 1915, p. 389.
9. Smithies: Amer. Jour. Med. Sciences, 1915.
10. Aaron: Jour. A. M. A., May 29, 1915, p. 1845.
11. Hedbloom & Cannon: (Loc. Cit. 3, page 127.)
12. Cannon & Murphy: (Loc. Cit. 3, p. 126.)
13. Rolliston & Jex-Blake: Brit. Med. Jour., 1903, ii, p. 68.
14. Case: Jour. Mich. State Med. Soc., April, 1917.
15. Soper: Amer. Jour. Med. Soc., August, 1918.
16. Alvarez: Surg. Gyn. & Bos. June, 1918.

Also

DISCUSSION

DR. GEORGE D. HEAD, Minneapolis: I appreciate very much being called upon to discuss this subject because it is a matter of importance. Dr. Hensel, in his analytical way, has gone to the root of the subject. I am quite sure it is a very good sign when we are willing to take up these matters relating to the functional side of digestion and discuss them from the standpoint of the facts as they have been demonstrated by experimentation.

I sometimes feel that in our desire to advance our knowledge so rapidly we forget the things that have already been taught and learned, and it is a good plan occasionally for the young men, as well as the men with gray hair, to go back over the work of previous observers, cull over the literature, and learn really what is known.

Three names come to my mind as pioneer observers or men who have contributed a great deal to the subject of the neuro-circulatory side and secretory side of the digestive apparatus. The first and foremost of these, and one I am sorry Dr. Hensel did not mention, is our great American gastro-physiologist, Dr. Beaumont, who did his work in the first part of the nineteenth century, and whom none of us should ever forget, because I believe he has contributed more to our actual knowledge concerning gastric digestion than any one of the observers and experimenters who has succeeded him.

The second man to whom we are greatly indebted is the Russian observer and experimenter, Pavlov, who has contributed much in his experimental work upon dogs by the production of an artificial accessory stomach. He has been able to study the secretory activity, the absorptive power, and the movements of the gastric wall in these so-called accessory stomachs.

And the third man to whom we are indebted and the one whose work Dr. Hensel has mentioned most frequently is Dr. Cannon, of Boston.

I want to say a word or two about Beaumont's observations. You will recall, if you have read the life of Beaumont, his observations upon his patient St. Martin, who sustained a gunshot wound of the lower chest and abdomen, which produced a hole in the stomach high enough so that, when it healed, a trap door was formed over the opening in the stomach wall. By pushing down this little door or portion of tissue that grew over the opening in the stomach, Beaumont was able to study St. Martin's digestion. The observations were not made upon a dog or other animal, or upon a sick person, but upon a strong, healthy man. Beaumont observed a lot of things, and I happen to have at home the little brown book in which Beaumont first reported his observations, a few copies of which are still in existence. I take down that book frequently and read over and over again his observations. If you can get hold of it, I think you should read it from cover to cover.

Beaumont observed that if St. Martin was ill with any infectious disease, like a severe cold or tonsilitis, and was fed with the usual foods, the meal ingested would lie for hours practically unaltered in the stomach, much as if St. Martin had swallowed a stone. Instead of the normal pink appearance of the mucous membrane with the elevated red papillae projecting above the surface of the stomach wall, which was usually seen following the taking in of a meal by St. Martin, the mucous membrane, when he was sick, took on a dark, angry looking appearance, and was covered with a grumous, mucoid material. If St. Martin became angry—and he frequently did whenever Dr. Beaumont would ask him to perform some service for him, since St. Martin lived with Beaumont for years, during which time these observations were made—the food would lie for hours sometimes in an undigested or partially undigested state, and did not pass on into the duodenum until such time as St. Martin had recovered his normal state. These observations, and many others made by Beaumont, illustrate what Dr. Hensel has pointed out with relation to the facts controlling the secretory activities of the stomach and of the intestinal tract.

The facts relating to the control of the secretory activities of the stomach remain yet to be determined, whether these disturbances of secretion depend upon altered states of the internal secretions or glands outside of the stomach, or whether it is a question of vasomotor control of the circulatory supply in the stomach wall, or of the secretory glands in the stomach itself remains still to be determined. I do not think anyone knows, but the practical point is that there is a very large and important factor entering into the act digestion in all of us, which we do not understand, which we call nervous control, but which plays a very important role. It lies at the basis of fully one-half of the gastrointestinal disturbances which we as physicians are called upon to treat.

DR. HUGH S. WILLSON, Minneapolis: There are two points I would like to bring out in regard to gastrointestinal motility.

The first is the relation of motility to gastric acidity and the probable acid control of the pylorus. With high acids the emptying time of the stomach

is slower and the head of barium column in any given time will be less advanced than in cases with low acids or achylias. This has been so obvious that oftentimes a fair estimate of gastric acidity can be made by observing the position of the head of the barium column in six hours.

The second point is in relation to colonic motility. After several years of constant observation of the barium meal in the colon I have never seen any but mass movement and that is comparatively rarely seen. We are always able to tell when a mass movement is about to take place by observing a mass of barium which has separated and in which all of the Haustral markings are wiped out leaving a banana shaped body. Within a few moments this mass will take on a rather rapid movement, traveling anywhere from a few inches to two or three feet. If no further movement is to take place for the time being the Haustral markings will then disappear.

DR. GEORGE EUSTERMAN, Rochester: Naturally we are watching to see if the physiologist cannot help us in the elucidation of some of these problems. In the first place, I think the physiologist has been too prone to work out his problems by following his own conception of what they should be; that the clinician has not been consulted enough is usually shown by the fact that Cannon says gastroenterostomy is an imperfect operation, and that pyloroplasty is more perfect. In our experience the opposite is true. Based on the treatment of sick human beings, we must remember, at all times, that treating animals and sick human beings are different propositions.

The second observation concerns the pain of ulcer. The physiologist maintains that in ulcer the pain is intermittent. We know the pain of ulcer is invariably a continuous pain, and perhaps on that account some of these conclusions may be questioned.

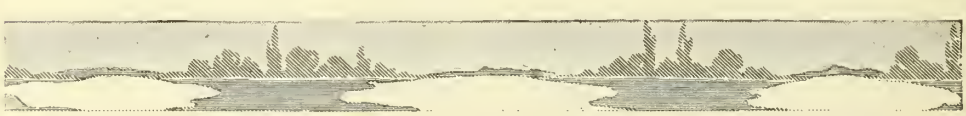
With reference to achylia, a patient may have gastric disturbances without local symptoms unless motility is disturbed. By peristalsis we undersand a rhythmic contraction of the stomach wall around its contents.

Dr. Head brought out an important point, namely, that the practical factors should not be overlooked in some of these motor functions. In connection with peristalsis we have factors that are both mechanical and psychic. On the basis of new investigations, it seems to me, the mechanism of peristalsis is not repeated in the stomach wall but in the duodenum and depends on the location of the caps. By tonus we now understand the ability of the stomach wall to contract around its contents at all times.

In connection with the observations of Dr. Cannon, Dr. Carman tells me that shortening of the diameter which Cannon has seen in the experimental animal does not obtain in the sick human being. He speaks of the dog's stomach as being elevated and the long axis of the stomach contracts. That is not true in the human patient.

CHAS. N. HENSEL, St. Paul: (Closing the discussion): Realinzing that this factor of gastro-intestinal motility is not stressed enough in the literature and believing in its value as an aid to diagnosis. I brought the matter to your attention today. There is so much to be said on this subject that I can only give you a bird's-eye view of it.

As Dr. Head has said, Beaumont was indeed the pioneer along with Pavolv, but their work was necessarily limited chiefly to the chemical side of digestion for this was about all they could observe through fistulae. Cannon, on the other hand, using the X-ray, had the advantage of studying the entire gastro-intestinal tract at one time, thus proving that the digestive tube acts as a unit—a fact that seems to have been but little appreciated. Cannon's work was not by any means confined to animals, the findings on animals being verified on man as well. Alvarez, in San Francisco, for the past half decade has been satisfactorily applying these ideas in a large clinical practice, but the profession generally still seem loath to put into daily use these ideas. The research laboratory has given us much valuable information but we have not had the wit to use it.



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Vol. III October, 1920 No. 10

EDITORIAL

VIENNA PHYSICIANS

Poor Vienna. Reports from all sources give a picture too awful to comprehend, of the misery in the once gay and lighthearted city. Must we actually go there and see with our own eyes to be moved to help our fellow physicians there?

It seems to some almost like a providential retribution that Vienna should be forced to pay such a penalty, following a war that the Austrian government was so instrumental in forcing upon the world. Shall we, however, let our fellow physicians and their families starve?

American physicians and American medicine have peculiarly benefited by an intimate contact with the profession in Vienna. It has been estimated that some two hundred Minnesota physicians have personally studied in Vienna. How many who have means to spare, have lifted their little finger to help the starving members of their own profession?

Spasmodic attempts have been made in isolated cities in the United States for Vienna relief. A local committee in Chicago has raised a considerable amount since the Armistice (we are still at war, which automatically prevents Austrian immigration) and as contributions included those from without the profession, relief was extended outside the profession in Vienna. An "American Relief Committee for Sufferers in Austria" has been established with headquarters at 261 Madison Avenue, New York City. Frederick C. Penfield, former American ambassador to Austria, is the honorary chairman.

A special fund for the aid of Vienna physicians alone has been created by this committee. If you possibly can, send a check to the treasurer of this committee, Alvin W. Krech, President Equitable Trust Company, 37 Wall Street, New York City.

DR. GEORGE MILLER STERNBERG

The name of Dr. Sternberg will ever be associated with that of Dr. Gorgas as the activities of these two most unusual men were strikingly similar. They were leaders in the same period of medical history—a period made remarkable by the discovery of the role played by microorganisms in respect to disease and particularly epidemiology.

Dr. Sternberg entered the army in 1861 and served with the Union forces through the Civil War, in various Indian campaigns and as surgeon general from 1893 to 1902, which period included the Spanish-American War.

He proved throughout his career to be anything but a narrow army doctor. Interested from the start in bacteriology and disinfection it was he that discovered the pneumococcus and first demonstrated in this country the organisms of malaria, cholera and tuberculosis. His interest in yellow fever began at Governor's Island, New York, and he fought many epidemics of the disease in our sea-board cities and unquestionably saved the country untold losses from the disease. He at one time contracted the disease himself. He was a member of the first Havana yellow fever commission and studied the disease extensively in Cuba, Mexico and Brazil.

In 1900, when surgeon general, he appointed the Yellow Fever Board which, under Dr. Walter Reed, conducted the experiments that so conclusively proved the mosquito to be the carrier of the yellow fever organism. It was he who founded the Army Medical School, organized the Army Nurse Corps and the Dental Corps, and established many military

hospitals including the tuberculosis hospital at Ft. Bayard.

In his later years he devoted himself to social service work and the city of Washington has benefited much in the improvement of living conditions and in the tuberculosis situation as a result of his activities.

Dr. Sternberg was one of the great medical men of the country and owed much in the way of assistance and encouragement to his wife. She has recorded his activities in book form which will serve as an accourate account of the career of one of America's foremost medical men.

THE BABCOCK AMENDMENT

The State Constitutional Amendment No. 1, introduced by Mr. Babcock, will be voted upon November 2nd. The salient features of the amendment are given for the benefit of the physicians of the State.

The primary feature of the new law is, that ordinary taxation is not to be increased but automobile owners are to pay on an average eighteen dollars per car per year, which tax will finance a most complete system of main highways throughout the state. This tax will vary according to the horse power and value of the machine and will go into a sinking fund which will be used to pay the interest on bonds and in time the bonds themselves. The amendment merely authorized the legislature to issue the necessary bonds not in excess of $10,000,000 a year nor to total more than $75,000,000. At present this tax of eighteen dollars per vehicle will raise some $5,000,000 and make a hitherto unavailable Federal Aid Allotment of $2,840,000 possible. If the number of machines in the state increase in the next few years at the rate they have in the past two, the mark of $10,000,000 will soon be met yearly.

The money raised from this source is to be used for the Trunk Highway System. If the amendment is adopted county appropriations now turned into the state will be used locally by each county.

The scheme is a good one. While the individual auto tax may seem large, eighteen dollars is a small item in the expense of operating a machine as most of us know. The eighteen dollars and more will be saved on wear and tear if any considerable country driving is done.

The value of good roads was recognized by the Romans. The good roads of France probably saved Paris in the late war. Good roads today are more essential than ever on account of the motor car. Good roads reduce the disadvantage incident to distance.

In the physician's sphere of activity, good roads are of primary importance. The county physician knows how short-lived his car is, simply on account of bad roads. They delay him at times when speed is a life saving proposition.

When it comes to medical meetings we have experienced the delays caused by the poor roads throughout the State. Those of us who have spent a vacation touring know how inferior our roads are to our sister state, Wisconsin.

Let us vote for the Babcock Amendment November 2nd.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

RED RIVER VALLEY MEDICAL SOCIETY

The Red River Valley Medical Society held its midsummer meeting at Warren, Minnesota July 12, 1920.

The meeting was in point of attendance one of the largest in the history of the society.

The program consisted of clinics at the Warren Hospital and the following excellent papers:

1. Some Obscure Bone Lesions—Dr. Emil Geist, Minneapolis, Minn.
2. Observations on Extra-uterine Pregnancy—Dr. Theodor Bratrud, Warren, Minn.
3. Health Survey of Marshall County—Miss Elizabeth Hanson, R. N., County Nurse, Warren, Minn.
4. Differential Diagnosis of Pulmonary Tuberculosis—Dr. M. George Milan, Thief River Falls, Minn.

Special entertainment was provided for the visiting ladies.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Southern Minnesota Medical Association will convene at Mankato, Minnesota, November 29th and 30th, 1920. The following are members of the Program Committee: Dr. A. F. Schmitt, Chairman, Mankato; Dr. H. W. Meyerding, Rochester, and Dr. E. M. Hammes, St. Paul.

ST. PAUL CLINIC WEEK

St. Paul has decided to hold a Clinic Week from Jan. 10th to 15th, inc., 1921. Nine large hospitals will

be available for clinics and two scientific and one social meeting will make up the evening programs. Details and tentative program will be given in our next issue. Dr. F. J. Plondke, Lowry Bldg., St. Paul is Chairman of the Committee on Arrangements.

OBITUARY

DR. HOWARD LANKESTER

Dr. Howard Lankester for twenty-five years one of the best known physicians in St. Paul died July 30th at Columbia Hospital, Milwaukee. He was within a few months of being 75 years old. He was born in England and came to America in 1887. He began the practice of medicine in Grand Forks, N. D. About 25 years ago he settled in St. Paul. He served as City Health Commissioner from 1910 to 1914. In October, 1918, when the influenza was at its height, Dr. Lankester, although 72 years of age, volunteered his services to the government. In 1919 he retired and went to Louisville, Ky., to live with his son. He was on his way to visit his daughter in Milwaukee when he became seriously ill. His widow, two sons and one daughter survive him.

DR. VAN WILCOX

Dr. Van Wilcox died at the age of 48 years at his home in Minneapolis, July 20, 1920. He is the son of the late Dr. M. R. Wilcox of Henderson, Minn. Dr. Van Wilcox after graduating from the University practiced out west, returning to Minneapolis about fifteen years ago. He is survived by his widow, one son, and a brother, Dr. M. Russell Wilcox of Minneapolis.

DR. J. C. FITCH

Dr. J. C. Fitch, for more than fifty years a practicing physician of Hastings, died at his home on July 23, 1920. He was born in Fitchville, Ohio, in 1841. He was a graduate of the Rush Medical College and was a veteran of the Civil War. He was married to Miss Frances Smith in Sharon, Ill., in 1867. He is survived by his widow and one daughter.

DR. BURTON J. MERRILL

The sudden death on July sixteenth of Dr. Burton J. Merrill of Stillwater, came as a shock to his many friends in the Northwest, notwithstanding the fact that he had been afflicted for several years with heart trouble.

Dr. Merrill was born in 1856 in Palmyra, Iowa and was a son of Philo and Sophira (Woodward) Merrill. He was educated in the public schools of Grinnell, Iowa and graduated from Grinnell College in 1875. He received his M. D. at the Bellevue Hospital Medical College, N. Y. in 1881 and moved to Hudson, Wisconsin. In 1882 he was married to Cornelia A. Merrill and moved the same year to Stillwater.

In early days Dr. Merrill was Professor of Theraputics and Materia Medica of the St. Paul Medical College and served as County Physician and Coroner of Washington County and also at one time as City Health Commissioner. He was also for a number of years Physician and Surgeon of the Minnesota State Prison.

NEW AND NON-OFFICIAL REMEDIES

During August the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Non-official Remedies:

Armour & Co.:

Corpus Luteum Tablets—Armour 5 grains.

Diarsenol Co.:

Sodium Diarsenol.
Sodium Diarsenol 0.15 Gm. Ampules.
Sodium Diarsenol 0.3 Gm. Ampules.
Sodium Diarsenol 0.45 Gm. Ampules.
Sodium Diarsenol 0.6 Gm. Ampules.
Sodium Diarsenol 0.75 Gm. Ampules.
Sodium Diarsenol 0.9 Gm. Ampules.

Sterile Solution of Lutein-H. W. D.—Each cubic centimeter contains the water-soluble extract of 0.2 Gm. lutein-H. W. D., freed of protein in physiological solution of sodium chloride. (for a discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1920, p. 201.) The solution is supplied in the form of Ampules Sterile Solution of Lutein-H. W. D., containing 1 Cc. Hynson, Westcott & Dunning, Baltimore.

Ovarian Residue-H. W. D.—The residue from the fresh ovary of the hog, after the ablation of the corpus luteum. Ovarian Residue is used for the same conditions as the entire ovarian substance, but is claimed to have the advantage of being somewhat more stable. Ovarian Residue-H. W. D. is supplied in the form of 5 grain tablets only. Hynson, Westcott & Dunning, Baltimore (Jour. A. M. A., Aug. 7, 1920, p. 378).

Benzyl Benzoate-Seydel.—A brand of benzyl benzoate complying with the tests and standards of New and Non-official Remedies. For a discussion of the actions, uses and dosage of benzyl benzoate, see New and Non-official Remedies, 1920, p. 48. Seydel Manufacturing Company, Jersey City, N. J.

Tablets Anterior Pituitary—Armour 5 grains.—Each tablet contains 5 grains of desiccated pituitary substance (anterior lobe) Armour (See New and Non-official Remedies, 1920, p. 207). Armour & Co., Chicago.

Tablets Ovarian Substance—Armour 5 grains.—Each tablet contains 5 grains of Ovarian substance—

Armour (See New and Non-official Remedies, 1920, p. 202). Armour & Co., Chicago.

Riodine.—A 66 per cent solution in oil of an iodine addition (see Iodine Compounds for Internal Use, New and Non-official Remedies, 1920, p. 143). Riodine is supplied only in the form of Riodine Capsules 0.2 Gm. E. Fougera & Co. Inc., New York (Jour. A. M. A., Aug. 14, 1920, p. 477).

PROPAGANDA FOR REFORM

Internal and External Antisepsis. — Despite the numerous efforts to demonstrate the efficacy of this or that chemical agent or drug as a gastro-intestinal antiseptic, the outcome has been that the supposed benefits were due to catharsis in most instances rather than to any real effect upon the bacteria in situ. Similarly, J. F. Norton, in an investigation made for the Council on Pharmacy and Chemistry, has shown that the value of "antiseptic" and "germicidal" soap depends on the soap and not on the antiseptic or germicide contained in them. In fact, ordinary toilet soap and the green soap used by surgeons was more efficient, evidently because the added antiseptics and germicides interfered with the lathering qualities of the soap (Jour. A. M. A., Aug. 14, 1920, p. 478).

Quinin and Urea Hydrochlorid for Local Anesthesia.—Quinin is a protoplasmic poison, and tissue necrosis may be caused by strong solutions of quinin salts. That this deleterious reaction actually does occur and has mitigated against the general use of quinin and urea hydrochlorid is confirmed by the report of the Committee of the A. M. A. on the Advantages and Disadvantages of Local Anesthesia in Nose and Throat Work. The committee reported that the only local anesthetic that produces edema and sloughing is quinin and urea hydrochlorid. The committee found that, as this local anesthetic has been abandoned in other fields of medicine, so it has been discarded for use in nose and throat operations. Two physicians who had published articles extolling the value of quinin and urea hydrochlorid in nose and throat operations now state that they have discontinued its use, though they had not published this unfavorable conclusion (Jour. A. M. A., Aug. 21, 1920, p. 559).

Value of Schick Test.—The Schick test, which can readily be applied to a large number of persons, makes it possible to differentiate those immune from those susceptible to diphtheria. It also facilitates the attempt to increase the number of the immune by suitable prophylactic toxin-antitoxin injections. By the use of the Schick test and toxin-antitoxin injections, institutions have been kept free from cases of diphtheria for years (Jour. A. M. A., Aug. 21, 1920, p. 545).

Silver Salvarsan.—According to a report of the Medical Research Committee of Great Britain, silver salvarsan is apparently a molecular combination of arsphenamine and silver in some form. The substance is on trial, and its promiscuous use at this time would be ill advised. In the United States no license for the sale of silver salvarsan has been granted by the Treasury Department and hence it may not be sold in interstate commerce (Jour. A. M. A., Aug. 28, 1920, p. 626).

Iodex and Liquid Iodex.—The A. M. A. Chemical Laboratory examined Iodex in 1915 and found that it contained only traces of free iodin, though claimed to contain "5 per cent therapeutically free iodin". Even the total quantity of iodin was shown to be only about one half of the 5 per cent claimed to be present as free iodin.

OF GENERAL INTEREST

Dr. B. Sorose of Minneapolis will locate at Moorhead.

Dr. H. A. Miller of Minneapolis has moved to Waseca.

Dr. Bernt Odegaard of Minneapolis will locate in Albert Lea.

Dr. C. H. Clark formerly of Duluth has located at Greenbush.

Dr. A. Sommerfeldt of Greenbush has gone back to Norway to live.

Dr. R. M. Evans of Rochester has gone to Brazil where he will practice.

Dr. J. G. Havens formerly of Cloquet and Owatonna has joined the Austin Clinic.

Dr. R. I. Stewart of Minneapolis has taken over Dr. O. S. Levin's practice at Wendell.

Dr. A. F. Branton of Willmar, and Miss Helen Tompkins of Mankato were married on Aug. 3rd.

Dr. H. A. Fasbender will locate in Hastings. He graduated from the University of Minnesota in 1919.

Dr. John H. Dorsey of Glencoe has gone to his old home at Grantsville, Maryland, where he will practice.

Dr. O. W. Scholpp has returned to Hutchinson from Chicago where he has been taking post graduate surgical work.

Dr. F. M. Dryden of Hallock has just returned from the east where he took a post graduate course in diseases of the eye, ear, nose and throat.

The physicians of Redwood and Brown counties have formed a medical society to be known as the Redwood-Brown County Medical Society.

Dr. G. A. C. Cutts has become associated with Dr. W. E. Chapman of Litchfield. Dr. Cutts was formerly located at Grove City and has spent the last year in California.

Drs. E. J. Huenekens, Max Seham and C. R. Moriarity announce that they will hereafter be associated in the practice of diseases of children at 538 LaSalle Bldg., Minneapolis.

Dr. H. W. Hill, formerly with the Minnesota Public Health Association, is now Director of the Institute of Public Health, Western University, Toronto, Ontario, Canada.

Dr. Hal Downey, Professor of Animal Biology in the Medical School of the University of Minnesota, has been engaged for a month in research work at the Mayo Clinic.

Dr. E. P. Lyon, Professor of Physiology in the University of Minnesota, will deliver a Mayo Foundation Lecture on "Physiologic effects of humidity," September 29 at the Mayo Clinic.

Dr. Iver F. Selleseth has resumed civil practice and announces the opening of his offices at 820 Donaldson Bldg., Minneapolis. He will limit his practice to orthopedic surgery.

A group of some twenty physicians of St. Paul have instituted plans for practicing their profession as a group. They will form the staff of the new Miller Memorial Hospital in St. Paul and will office in the Lowry Building.

Dr. F. W. Gaarde, formerly a member of the staff of Rush Medical School, has joined the medical staff of the Mayo Clinic as First Assistant in the Section on Diseases of the Thorax.

The Osler Society for the study of Medical History has been organized by a group of twelve men in the Mayo Foundation. Dr. W. C. MacCarty, Associate Professor of Pathology, has been chosen president.

Dr. Udo J. Wile, Professor of Dermatology and Syphilology in the Medical School of the University of Michigan, lectured last month at the Mayo Clinic on "A study of the spinal fluid in 1869 cases of syphilis at all stages."

Dr. Leonard G. Rowntree, Professor of Medicine in the Medical School of the University of Minnesota, and Dr. Reginald Fitz, associate in medicine of the Massachusetts General Hospital, have joined the staff of the Mayo Foundation and the Mayo Clinic at Rochester, Minn. Drs. Rowntree and Fitz will be associated in the further development of research in internal medicine and in the hospital care of medicial cases in the Mayo Clinic.

The Graduate School of the University of Minnesota will offer a nine months' preliminary course of graduate work in ophthalmology and otolaryngology. The course will consist chiefly of advanced work in the science departments, giving fundamental training essential to this specialty. The course is not intended to prepare students to enter private practice, but is designed to serve as a basis for further thorough clinical training. Such training may be obtained by service as resident in a special hospital, or by acting as assistant in a clinic of recognized standing, or by service in a fellowship under the University of Minnesota Graduate School plan. The course will begin September 29. Requests for information should be addressed to the Dean of the Graduate School, University of Minnesota.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH.

THOMAS A. PEPPARD
LA SALLE BLDG., MINNEAPOLIS

INFLUENZA IN THE TUBERCULOUS: Morris Fishberg & Ernst Boas, (Amer. Jour. of Med. Sc., Aug., 1920). Fishberg has constantly since the war upheld his belief that the relationship between influenza and tuberculosis is merely incidental, and that influenza as a precursor or an activator is a nearly negligible element. With his experience at the Montefiore hospital, during the recent epidemic in January and February of 1920, he had a morbidity of 28 cases of influenza in 127 tuberculous patients, the proportion being about the same as in non-tuberculous individuals exposed to infection. From his experience also he shows that the stage of tuberculosis has no influence on the liability of the patient to contract influenza. Of the 28 patients, however, who contracted the disease, 9 died, and 22 developed bronchopneumonia, an incidence of bronchopneumonic development higher apparently than is usually seen in uncomplicated influenza. In 1918 his experience was that the tuberculous patients relatively showed less tendency to bronchopneumonia than the non-tuberculous. In the epidemic of 1920, however, this has not been the case, and the tendency to its development seemed to be more noticeable. The clinical course of influenza was similar to that in non-tuberculous patients, and there seemed to be no relationship whatever between the clinical form of tuberculosis and the development of influenza; neither did he note any definite tendency to complicating conditions as a result of the concomitant influenzal infection.

F. J. Hirschboeck.

SURGERY

SUPERVISORS:

E. MENDELSSOHN JONES
LOWRY BLDG., ST. PAUL.

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER.

AFTER CARE IN SUPERAPUBIC PROSTATECTOMY—SOME NEW FEATURES: T. L. Deavor (Amer. Jour. of Surg., Vol. 34, No. 7) compares the suprapubic and perineal methods in order to bring out the features of postoperative care. The advantages of the former operation are, in his opinion, as follows:

1. Entire field open to inspection and within easy reach. Rectal pressure elevates the prostatic region. In cases of sepsis it is the first stage in a two stage operation. 2. Complications, that is hemorrhage, stone, prostatic bar, easily handled. 3. Gland is just as easily accessible. 4. No more damage need be done to the prostatic urethra. 5. Drainage both ways may be used. 6. Catheter may be fixed in bladder. 7. Wound well placed for subsequent drainage, away from the rectum. 8. Fistula almost unknown. 9. Mortality not increased. In the perineal case we have less shock, and less danger of ascending infection.

As a result of trauma to the bladder incident to opening and removing the gland, the expulsive power of the bladder is diminished and thus gravity drainage is very important. It is immediately established by means of a large catheter which is allowed to remain in position. Self-retaining catheters and these fixed in position by means of adhesive are unsatisfactory, and he has devised a method in which a strong piece of linen thread is sewed though the eye of the catheter, which extends into the bladder one inch, and then brought out through the abdominal wall lateral to the wound and tied over a rubber tube. When the catheter is removed the linen is drawn up one inch, iodined, cut off, and the catheter withdrawn. He uses aromatic sulphuric acid to keep the earth phosphates in solution and prevent precipitation on the catheter.

The drainage tube in the wound should be of firm material and of large size. It is fastened to the bladder wall by a purse string suture, drawn tightly, which maintains a water-tight union for about a week. After the operation the bladder is irrigated freely with hot boric to test the drainage system and to remove blood. Drip irrigation is started, entering the large tube and draining out of the catheter. Ice cold boric is used if the patient is not too feeble. The bladder is flushed every three hours.

If clots form to obstruct the drainage they may be aspirated by means of a large syringe or flushed out with the irrigation.

There being no adhesive tape on the catheter, local cleanliness is made much easier, and should be accomplished by means of frequent use of soap and water and bichloride. In the later stages when hemorrhage has ceased and mucous has begun to clog the tube, soda solution is of assistance as an irrigation. The importance of shortening the period in bed is emphasized. The patient should be up on a back rest early and out of bed in two to four days.

The upper drainage tube is removed in two to four days, but the catheter remains until the bladder function is restored, from one to three weeks. After the upper tube has been removed a clamp may be put on the catheter and removed every half hour, in order to help restore the muscle tone of the bladder.

After leaving the hospital routine care, proper nursing, and advice as to habits should be given. Laxatives, urinary antiseptics and the care of any remaining cystitis, should be considered very important.

HAROLD E. HULLSIEK.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:

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ALBERT G. SCHULZE,
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INCISIONS OF THE INTRAVAGINAL PORTION OF THE CERVIX IN THE COURSE OF LABOR AT TERM: M. V. Cathala, (Gyn. et Ob. Revue Mensuelle, Vol. 1, No. 2). Although this procedure is unpopular in France, the author attributes bad results to improper selection of cases and unstandardized technique. When definite indications have been met such incisions permit prompt and safe delivery at term. Concerning obliteration and dilatation of the cervix, Cathala lays more stress on the condition of the ring formed by the attachment of the vagina about the cervix. Unless this has been dilated to a diameter of about 9 cm, passage of the fetal head will result in extension of the incisions as lacerations into the broad ligaments no matter what be the condition of the cervix. The degree of this dilatation may be measured or estimated by the arc of a circle formed by the protruding presenting part and cervix into the vagina. To give a diameter of 9 cm the arc should be at least 14 cm measured by the fingers in the lateral culdesacs. If the greatest diameter of the fetal skull has passed or can pass this ring, incisions are permissible, otherwise vaginal cesarean section is indicated. The author reports 14 cases, 12 of whom were primiparae. Indications were fatigue of the mother or fetal distress. Delay was due to scar tissue in 1, and slight pelvic contraction in 12, with slow and imperfect dilatation of the cervix.

Other methods: Bags are difficult to insert between fetal head and distended cervix, and are likely to disturb engagement and position. Manual Dilatation is often incomplete and may result in extensive tears. Instrumental dilatation is even more dangerous. Method: The author uses an anterior incision in the median line and if necessary also posteriorly, large vessels are avoided, there is less hemorrhage, apposition is better, and there is less eversion or deformity. If it becomes evident that the head can not pass the vaginal ring, one can still do a typical vaginal section. He does not incise the perineum. With good retraction the cervix is visible and tenacula are not used. The incisions are not sutured since apposition is good, the cervix odematous, and hemorrhage from the wound is not severe unless the tear extends into the vagina or up into the lower uterine segment. Postpartum atony may require packing. Danger of infection is not increased by the

incisions but depends on the condition of the mother. Natural healing with no deformity occurs as a rule.

ARCHIBALD L. McDONALD.

PEDIATRICS

SUPERVISORS:

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SYNDICATE BLDG., MINNEAPOLIS.

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO.

A STUDY OF PNEUMONIA IN INFANCY AND CHILDHOOD DURING RECENT EPIDEMICS: Henry Heiman (Am. Jour. Dis. of Child., August, 1920). Pathology—Out of 336 cases we found the left lower lobe most frequently involved in lobar and bronchopneumonia. In our cases that came to necropsy, there were typical areas of consolidation in all stages, and hemorrhagic foci were almost constant.

Wollstein and Goldbloom, from necropsy findings in 18 cases in infants, report that the characteristic features were purulent infiltrations of the alveolar walls and septa, hemorrhages and suppurative bronchiolitis.

Roentgen-Ray Findings. Of 28 roentgenograms of the chest taken in cases of lobar pneumonia, 25 showed definite shadows. Of 73 cases of bronchopneumonia, 68 showed more or less distinct shadows, which were interpreted as infiltrations. In 8 cases in which no physical signs were elicited, but presented the clinical picture of pneumonia, the roentgen-ray revealed the presence of lesions in the lung. We have found the roentgen ray of invaluable assistance in the diagnosis of both types of pneumonia.

Blood Examinations. A count below 10,000 and a polymorphonuclear count below 50 per cent is significant of a very poor resistance. The average blood picture was 25,000 leukocytes with 80 per cent polymorphonuclears.

Complications. The most frequent complication encountered was acute otitis media. Treatment was conservative. Unless there is a distinct bulging we do not incise.

Empyema developed in seventeen cases. We strongly advise against early operation before the acute stage had subsided. The results obtained by watchful waiting in these cases are immeasurably better than immediate operative interference after the aspiration of pus from the pleural cavity.

Treatment. Of prime importance is the hygienic care and efficient nursing. A bright sunny room, with an abundance of fresh air, quiet surroundings and well trained nurses under close supervision are important essentials.

We do not favor the cold air treatment in any type of case. The gastro-intestinal tract should receive the closest attention. An abundance of water, gruels, and fruit juices are indicated. We do not recommend the general use of digitalis, for we have obtained no appreciable beneficial results from the same. May we not look forward to further differentiation of types of organisms in the pneumonias of infants and children with the hope of securing specific therapy?

ROY N. ANDREWS.

ROENTGENOLOGY

SUPERVISORS:

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MAYO CLINIC, ROCHESTER.

R. G. ALLISON,
SYNDICATE BLDG., MINNEAPOLIS.

A PRACTICAL METHOD OF ROENTGEN RAY DOSAGE WITHOUT THE AID OF A RADIOMETER: William D. Witherbee and John Remer—(Arch. Derm. and Syph., May, 1920). The method has been in fairly general use for two and one-half years and its chief advantages are its easy application and practicability. It can be used with any standard interrupterless machine and Coolidge tube.

The authors define the standard of roentgen ray dosage. The amount of radiation reaching the skin is determined by four factors: voltage or K. V.; milliamperage or current (MA); the time (T in minutes), and the distance from target to skin (D in inches). Voltage (K.V.) is often expressed in inches between the spark gap terminals. Analysis of the four factors involves maintaining three of them constant throughout the exposure. It was found that an area of the chest given 3 Sp. G., 3 MA at a distance of 8 inches for four minutes caused the hair to fall out during the third week, but that it all returned by the fourth month. This formula (3 Sp G—3 MA—4 minutes, with 8 inches distance) is called one skin unit, and is the dose required for treating ringworm of the scalp. It would correspond to one on the Holzknecht radiometer, which, in Holzknecht units, would be 4 H.

By using pastils and a Holzknecht radiometer it has been found that, if time, voltage or milliamperage are doubled separately, the other three factors remaining constant, the dose will be doubled if no filter is used; also that the reading at the half distance will be four times that on the skin at full distance, therefore inversely to the square of the distance.

3 Sp G	3 MA	8 D	2 minutes equals ½ skin unit.
6 Sp G	3 MA	8 D	2 minutes equals 1 skin unit.
3 Sp G	6 MA	8 D	2 minutes equals 1 skin unit.
3 Sp G	3 MA	16 D	4 minutes equals ¼ skin unit.
3 Sp G	3 MA	8 D	4 minutes equals 1 skin unit.

The dose of one skin unit adopted by the authors as their standard would be expressed as follows:

$$\frac{3 \text{ Sp G} \times 3 \text{ MA} \times 4 \text{ minutes}}{8 \text{ inch} \times 8 \text{ inch}} \quad \text{or} \quad \frac{3 \times 3 \times 4}{8 \times 8} \quad \text{or} \quad \frac{9}{16}$$

Many examples are given to illustrate the use of the method in finding out any factor the other three being known, such as the distance at which it would

require a certain voltage, milliamperage and exposure to give a standard dose. The method may also be used in roentgenography to determine the number of plates that may safely be taken of a given area. If 3 Sp G—3 MA—2 minutes is used, what is the dose?

$$\frac{8 \text{ inch D} \times 8 \text{ inch D}}{3 \times 3 \times 2 \text{ equals } 9} \quad \frac{3 \times 3 \times 4 \text{ equals } 36 \text{ or } 9}{8 \times 8} \quad \frac{9}{32}; \quad \frac{9}{64} \quad \frac{9}{16}$$

standard or skin unit. $\frac{9}{32}$ $\frac{9}{16}$ equals $\frac{1}{2}$ skin unit.

If one wants to use 3 Sp G — 3 MA and 8 inches distance to give $\frac{1}{2}$ a skin unit, how much time will be required?

$$\frac{3 \times 3 \times T \text{ equals } 9}{8 \times 8} \quad \frac{9}{64}$$

The standard for 1 skin unit is:

$\frac{9}{16}$; or for $\frac{1}{2}$ — $\frac{9}{32}$ $\frac{9}{32}$ $\frac{9}{64}$ equals 2 minutes' time.

The distance required to produce one skin unit is found by dividing the product of the three known factors by the standard formula for one skin unit $\frac{9}{16}$

With all four factors known, the product of their formula divided by the product of the standard formula for one skin unit $\frac{9}{16}$ will give the dosage in skin units. If one of the four factors is unknown, and the other three decided on, the product of the standard formula for one skin unit $\frac{9}{16}$ divided by the product of the three known factors gives the unknown factor for one skin unit.

The dose of unfiltered roentgen ray can thus be accurately and easily determined, but owing to the proportionately large filtration of the ray generated below a 3 m gap or 3 Sp G by the glass in the Coolidge tube the above rule of unfiltered dosage does not apply.

A. U. Desjardins.

BOOK REVIEWS

A TEXTBOOK OF DERMATOLOGY. By J. Darier. Authorized translation from the second French edition, edited with notes, by S. Pollitzer, M. D. Illustrated. Lea and Febiger, Philadelphia, 1920. Price, $8.50.

This book presents to the English student the work and viewpoint of the French School of Dermatology. Written by a master of his subject, one whose greatest characteristic as a writer is his clear description of lesions as well as of pathological anatomy, it cannot fail to hold the interest of the student of dermatology.

The first edition of the translation was exhausted several years ago, and the delay in the appearance of the second has been due to the great war.

The work is carefully translated and edited, well printed on excellent paper, illustrated with numerous engravings and although not as large a volume as some works on dermatology deserves a place among the best of its kind.

E. C. Gager.

DISEASES OF THE CHEST AND PRINCIPLES OF PHYSICAL DIAGNOSIS. George William Norris, A. B. M. D. and Henry R. M. Landis, A. B. M. D. Second edition. W. B. Saunders Co., $8.00.

The second edition of this excellent work contains several new chapters, including one on electrocardiography. It is profusely illustrated not only with photographs of isolated organs but also with reproductions of sections through the chests of frozen cadavers.

It is somewhat surprising to note in such a fine treatise on chest conditions, that the X-Ray, as a diagnostic aid in detecting early tuberculosis, is discarded as being of no avail.

It is a book, however, deserving a place in the library of every careful physician.

Everett K. Peer.

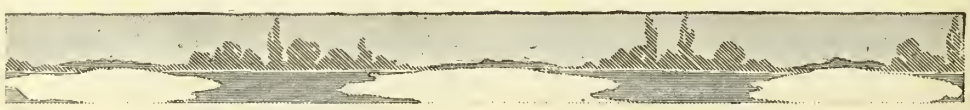
PRINCIPLES AND PRACTICE OF INFANT FEEDING. By Julius H. Hess, M. D. Second revised edition, 1919. F. A. Davis Company, Publishers, Philadelphia. Price $2.50.

In this second edition the author follows the same general outlines as in the first edition. He presents the subject in a small volume of about 350 pages in a concise form, taking up both the theoretic and practical sides of infant feeding.

Throughout the work he has made revisions and additions which have enhanced its value for the teacher, practitioner, student and nurse. In the chapter on metabolism he has enlarged upon the discussion of the lipoids and introduced a new paragraph on vitamines; setting forth the present status of our knowledge of these substances and their relation to growth and normal development. The most material change made has been in the chapter on artificial feeding. Here he establishes, as an absolute basis for the preparation of the diets, the requirements of the infants in grams per pound body weight, of proteins, fats, carbohydrates, salts and water for growth and development, rather than the percentage composition of the mixture or its caloric value, though both these methods are given as a check on the formula.

The work retains all the important and essential details of the first edition, which made it so acceptable to all interested in this vital subject, and all who have occasion to consult the second edition will find it even more helpful with the revisions and additions.

J. D. Geissinger.



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SOCIALISM AND THE PRACTICE OF MEDICINE*

By Jennings C. Litzenberg, B. S., M. D., F. A. C. S.
Minneapolis, Minn.

Members of the Hennepin County Medical Society: It is in no perfunctory way that I express my appreciation of the honor you have done me by making me your president. To be chosen to preside over one's home society, where all his colleagues know one's faults and are willing to overlook them makes the honor doubly gratifying and I thank you sincerely, but I appreciate still more the loyal support you have given me during my term of office. When the year began, large numbers of the members were absent in the service of our country, which made the work of the society difficult. Now the war is over; our fellow members have returned; we are proud of them; we are glad they are back; now let us get to work and face the post war problems as patriotically as our colleagues met the war situation.

It has been uttered so often that it has almost become a platitude that the war has changed the life of the world entirely, socially and economically. Nevertheless it is true and the problems now facing the medical profession are no exception. Forces which began to work before the war have been given added impetus and new difficulties present themselves.

I wish to consider only one of these problems tonight, namely; the possible effect of certain socialistic tendencies on the future practice of medicine.

Our country was unprepared for war and the direct consequences are well known. Is the medical profession prepared to meet the proposed social changes? I fear not, and it is for that reason that I have chosen this subject, with the hope that I may be able to emphasize the necessity of the profession familiarizing itself with the facts, else others will settle the questions in a way that will be unfair to us and to the public.

Radicalism is in the air. It is disturbing every country. Many phases of social, economic and political life are affected and we hear on every hand bandied about such terms as "socialism", "bolshevism", communism" and "nationalization" with, perhaps, little understanding of their real meaning, except that they all spell "radicalism". Will the practice of medicine be able to escape any effect of this radical thought? That is impossible. But are we then to sit idly by in smug isolation or shall we help the world to resist that which is bad in all this agitation and fearlessly advocate that which may be good in it even if we must change some of our traditional conservatism.

A new era is certainly approaching in the practice of medicine. Problems are demanding solution which the present order seems unable to solve, and we cannot give the proper answer by simple negation. Opposition will not suffice. The medical profession can only secure its rights and do its duty to the public by a thorough study of the social and economic problems involved, by a determination to approach the solution with open-mindedness and a sympathetic spirit of public duty.

The question can never be settled till settled right and it can never be right till we recognize to the full our duty to the public, as well as demanding that our rights be recognized.

The legislatures of the various states show increasing tendency for investigation, regulation and socialization of medicine, and the pity of it all is that this is often done without con-

*Address of the retiring president of the Hennepin County Medical Society.

sultation with the medical profession. This is due largely, I believe, to our not keeping in touch with advancing thought and to a tendency on our part to resent any change. This results in an unintelligent attitude of opposition which smacks too much of standing on our rights rather than intelligent discussion born of thorough knowledge of the social problems involved and their effect on the public, as well as upon ourselves.

As we trace, historically, the development of social insurance as it touches medicine, we will get a clearer idea of what it means and whither it may lead. We will also see that if the medical profession had contributed its best thought instead of its rabid opposition, the early proposition would have been more satisfactory and later proposed modifications less radical.

In the early eighties of the last century socialism had assumed such proportions in the German Empire that Bismark became alarmed. When his oppression and coercion did not stem its tide, he decided to change his tactics and throw to the socialists a sop. This he did in 1881, when he appeared before the Ricchstag and proposed sickness insurance, accident insurance and old age pensions. This was the beginning of socialized medicine. Compulsory sickness insurance was made German law in 1883, accident insurance followed the next year and the old age pension enactment came in 1889.

The compulsory feature in these acts was the only thing in them that was original with Bismark. When introducing these bills Bismark said: "Do this without fearing either the sacrifice or the cry of 'State Socialism'. I believe the socialists will then sound their bird call in vain." He was a poor prophet.

The sop was accepted but socialism continued to grow, as is likely to be the case when radical ideas succeeded in modifying conservative thought. Radicalism seldom succeeds in forcing its own program but not infrequently it alters conservatism, liberalizing it sometimes so much that what once seemed radical is now liberal and tomorrow will appear conservative.

It is well for us as a profession to remember this, as we trace the development of social insurance.

When Bismark proposed compulsory health and accident insurance and old age pensions the idea seemed extremely radical, but as different countries and states of our nation have wholly or in part adopted them they appear less extreme. This is particularly true of industrial accident insurance or "Workman's Compensation" as it is called in this country for now that forty-five states have adopted it we have become familiar with it. It has become American law; therefore we forget its socialistic origin.

Social insurance was adopted in one or all of its three phases in Germany in 1884; Austria in 1887; Hungary in 1891; Finland in 1895; Great Britain in 1897; Denmark, France and Italy in 1898; Spain, New Zealand, South Australia and British Columbia in 1902; Russia and Belgium in 1903; Cape of Good Hope and Queensland in 1905; State of Nuovo (Mexico) in 1906; Transvaal in 1907; Alberta, Bulgaria, New Foundland and the United States (for Federal Employes) in 1908; Quebec in 1909; Nova Scotia and Manitoba in 1910; Switzerland and Peru in 1911; Roumania in 1912 and in forty-five states of the Union from 1911 to 1918. Thus, we see that in one phase or another, it is literally sweeping the world. We cannot say that such a tide is only passing socialistic agitation, nor can we hope to stem it by merely asserting that it is wrong. The situation calls for the most careful and thorough study, intelligent analysis and than appropriating what ever good there may be in it to our American life.

The Wisconsin Workman's compensation law was the first to withstand the test of constitutionality in the highest courts.

Forty-five states have now adopted Workman's Compensation laws which, though not entirely satisfactory have been sufficiently successful in the courts and in practice to establish the idea originally socialistic in American law. That which was "radical" yesterday is only "liberal" today; will it be thought "conservative" tomorrow? Thomas Howell, Superintendent of the New York hospital says: "This country has successfully made the first step in social insurance — workman's compensation. The next step is to provide health insurance."

What is Health Insurance?

The American Association of Labor Legislation drafted a so-called "Model Bill for Health Insurance" which was to be introduced into all state legislatures, which provided:

(1) Cash benefits equal to two-thirds of the workers wages for twenty-six weeks; (2) free medical and surgical service; (3) free nursing; (4) free supplies; (5) free hospital; (6) cash benefits to dependents; (7) funeral benefits; (8) maternity benefits; (9) free dental care; (10) free medical attendance for dependents; (11) compulsory for all earning less than $1,200 per year.

It is proposed that the cost of health insurance shall be met by assessing two-fifths to the employer or 1.5 per cent of his pay roll, two-fifths to the employee or 1.5 per cent of his wages and one-fifth to the State or .75 per cent of the payroll.

In many of the larger manufacturing concerns voluntary associations, either of the employees alone or of employer and employees together, have been formed upon a similar plan. This is a distinctly socialistic tendency in which the physician's rights are often prostituted, chiefly because his aloofness leaves him out of the settlement. Would it not have been much better, by a sympathetic attitude, to have been a part of, instead of apart from these consultations?

Some employers have met the problem with what is called "Group Insurance" by which he insures his employees, without medical examination, against death, disability, sickness and provides old age pensions. Those who argue for compulsory health insurance aver that their plan proposes to make group insurance mandatory for all employers.

I shall not weary you with a detailed recital of the arguments for and against health insurance for it is not my purpose to espouse either the pro or con side of the issue, but it is my desire to try to impress upon you that there are two sides to the question and that there are so many good arguments on both sides, and there are so many facts to be determined, that it behooves the medical profession to acquaint itself with all phases of the problem, so that it may take an intelligent part in the solution. Otherwise the questions will be settled for us and we will "be left at the post".

Briefly the arguments for health insurance are: (1) There is too much preventable or curable sickness among workers, thus hampering industry and injuring the family of the worker; (2) the average annual loss of time is nine days per individual; (3) health insurance would protect the worker and his dependents and help industry; (4) it would supply all the workers' sick needs—physician, nurse, surgeon and supplies, also reduces medical bills; (5) he would get a cash benefit of a reasonable part of his wages for a limited time; (6) it is practical as proven for thirty-five years experience.

The arguments against compulsory health insurance are: (1) It is paternalistic, originated in Germany and is un-American; (2) European experience does not prove its value; (3) the public does not demand it; (4) the labor unions do not want it; (5) the medical profession is against it, because it is a sacrifice of thorough work to hasty superficiality and leads to dishonest practice; (6) it leads to malingering and unnecessary running to the physician; (7) its cost would be excessive to the taxpayers; (8) it would lead to political jobbery; (9) the physician would be a drudge, overworked and superficial in his labors; his remuneration would be small and his individuality would be dwarfed.

The proponents of health insurance reply to the criticism that it is "paternalistic" by asserting that it is not paternalism but democracy, because all interested parties cooperate in its management under state supervision.

The workings of health insurance, and the radical limit to which it may be proposed to extend it, when the medical profession does not take part in the solution of the problems from the beginning, is very well illustrated by the history of health insurance in Great Britian.

Sickness Insurance or "Health Insurance" as it is called in England attracted little attention in America, until our interest was excited by the bitter controversy between the British Medical Association and Lloyd-George's government after the introduction of the "National Health Insurance" bill in the House of Commons in 1911. This bill proposed the insurance of persons over sixteen years of age providing them with: (1) Medical treatment, including

medical and surgical supplies; (2) treatment in sanatoria for consumptives; (3) payments of maternity benefits; (4) arrangement for payment of additional benefits through mutual societies; (5) compensation for injuries to workmen; (6) benefits to be administered through local boards directly or, through benefit societies making arrangement with medical men appointed under the act, called "The Panel"; (7) payments to be made by the government, two shillings nine pence; by the employer, three shillings nine pence; and by the insured, four shillings nine pence; (8) per capita payment of fees to the physician was adopted.

When introducing the bill Mr. Lloyd-George said:

"When Bismark was strengthening the foundation of the new German Empire one of the very first tasks he undertook was the organization of the scheme which insured the German workingman and their families against the worst evils which come from the common accidents of life, and a superb scheme it is. It has saved an incalculable amount of human misery to hundreds of thousands and possibly millions of people who have never deserved it."

The whole medical profession of Britian, led by the British Medical Association, fought the bill strenuously, uncompromisingly, and with the bitterest acrimony, but Lloyd-George forced its passage.

As we watched the fight in sympathetic interest with our British colleagues we have consequently observed the workings of the bill with scepticism. Conflicting reports have reached us as to the results, but the weight of opinion seems to be that while there are serious defects in the bill it has been fairly satisfactory and the principle involved merits further trial, after defects have been remedied.

Dr. Boyce of the Canadian Immigration Medical Service says: "The benefits to the persons insured and to the medical officers have proved so great that the British Medical Council has urged extension of the act to include further payments to specialists and the inclusion of such work as prenatal care, child welfare, etc."

After the act in Great Britian had been in force seven years a Committee of the British Medical Association made the following report: "The degree of unanimity so far disclosed is somewhat remarkable and suggests that the scheme, which is proving a distinct gain to the medical profession as well as to the public, be still further extended to the dependents of insured persons and for providing when necessary, specialists and nursing service, institutional treatment and maternity attendance."

The act provided no institutional treatment except sanatoria for tuberculosis. The maternity benefits of thirty shillings with an additional thirty shillings if the wife were also a worker, did not provide attendance at childbirth.

That experiments in social medicine, if at all successful, lead to more liberal extensions or to quite radical steps, is attested by a proposition to extend health insurance to the whole population as set forth in the following editorial in the Journal of the American Medical Association under the caption "An English Experiment in Social Medicine."*

"In England the medical profession and public are apparently in a state of readjustment."

"Social insurance in the four years preceding the war, the needs and emergencies of war times, and the discussion of the last year, culminating in the creation of a National Health Ministry, all have combined to arouse and concentrate the discussion on the improvement of Medical services."

"Dr. David McKail, lecturer on public health at St. Mary's College and Dr. William Jones, clerk and treasurer of the Glasgow Insurance Committee have worked out a plan for public medical service as a substitute for the social insurance scheme now in operation. They condemn the present plan for failure to provide any form of institutional treatment except sanitoria treatment of tuberculosis; and for furnishing medical service to only one-third of the population. They propose to build up a complete medical service, furnishing unrestricted treatment to every citizen and envolving the enrollment of the medical profession and public control of all general hospitals and infirmaries. The proposed plan is founded on an experiment to meet war conditions, when, for a time, dispensaries were established in Glasgow for concentrating the patients of absent physicians. The city was divided into districts and a consultation center established in each. They es-

*Vol. 73, No. 22, p. 170.

timate that for 100,000 inhabitants twenty-seven physicians working thirty-three hours a week would be required, a twenty-five per cent increase for reasonable needs would neeessitate a staff of thirty-three physicians, each having a vacation. Births would require four obstetricians, minor surgery and specialtics six, making a total of forty-three physicians exclusive of institutional and consultant serviee. The staff would be composed of seniors receiving $4,000 to $4,500, middle grades receiving $2,500 to $3,500 and juniors receiving $1,500 to $2,000. Each junior would be allowed time for and be required to do graduate work and speeial study with a view to advancement in service.

"Provision is also made for dental treatment.

"The cost would be less than seven shillings per capita.

"An interesting side light is thrown on the provision for free choice of physicians under the scheme of social insurance now in operation. No effort was made to exereise any choiee, all going to the nearest and most conveniently loeated physician.

"The alleged advantages to the physician under the proposed new plan are: limitation of working hours, guarantee of adequate income, avoidance of waste of time and energy, the opportunity for increased income, the accumulation of experience and the opportunity for graduate and special study for every practicing physician.

"The advantages claimed for the individual are better treatment at a much less expense and the advantages for the eommunity are economy of administration and the prevention of a large amount of disease." (See London Lancet Oct. 11, 1919).

This is an extension of health insuranee never dreamed of by its originators and it goes far beyond the wildest schemes proposed on this side of the water; it approaches "the limit" in the socialization of medicine, only "nationalization" of physicians could go further, and even this is now proposed.

As I said before, one radical thing leads to another. Now we see the following piece of news coming out of London in the public press under date of Deeember 11, 1919, and topped with a big heading "British Doctors May Beeome Nationalized". "There is a prospect in the near future of the medical profession in Great Britian becoming nationalized. That is, all doctors will be nnder supervision of the state, paid by the state and their energies directed by the state. Doctors will then become servants of the state, like army and navy officers and eivil servants.

Dr. John Playfair, President of the Medical Guild, says "that numbers of the doctors would be quite willing to accept state medical serviee if such service were limited to the needy classes. Their fear, however, was that the state medical service proposed by the government would be of mueh wider scope than that which the Guild would approve, and might ultimately embrace the whole community, including hospitals, and all institutions in any way eonnected with maintenance of the health of the people."

The Workman's Compensation law was adopted in Minnesota with the physician's having little voice in its framing. Employers, labor leaders and lawyers have more voice in a subject in which the physician is vitally interested and in the suecess of whieh he is the very erown of the arch.

This is chiefly the fault of the profession itself, which has allowed the rapidly moving thought of the economic and industrial world to sweep by as a thing apart, and in its complacent isolation has allowed others to propose solutions of problems whieh cannot be rightly solved without the best thought of the medieal profession.

Health insuranee has not yet come in Minnesota but it always follows elosely upon the heels of accident insurance and it will be proposed and settled by those who cannot, in the very nature of things, understand, unless the profession awakes and studies the problem thoroughly and then takes a hand in the settlement. It will not do to simply organize opposition for that will be interpreted as a selfish attempt to protect our own interests, but the question must be taekled in a broad minded way. This will require study and a sympathetic attitude toward the welfare of the worker and the general publie.

We should begin to prepare ourselves, now, for the inevitable discussion by becoming familiar with what health insurance is. When the time comes and come it will soon, a commission will probably be formed, as in other states, to investigate the whole subject which should de-

termine whether there really is a need for health insurance in this state, to find out what has been done in other countries and states, to determine the costs, which will be enormous, and to decide the source from which the money shall come.

As Mr. Lapp, Director of Investigation of The Health and Old Age Insurance Commission of Ohio says: "The whole truth must be known. The issue is too important and the consequences too vital to the social and economic welfare of the state to warrant action on anything less than the whole truth. Health insurance is approved by all, just as fire, life and accident insurance are accepted; the only question at issue is whether health insurance can be and should be organized by the state on a universal compulsory basis."

Prevention as well as cure is needed. Health departments have to do with prevention, health insurance with sickness after it occurs. The difficulties of the situation are illustrated by the divided report of the Illinois commission. The majority of the Illinois Health Insurance commission reported that it did not feel justified in recommending compulsory health insurance. The minority report by two members, one a physician and one a layman, reported that the investigations of the commission give "conclusive evidence of the need for a system of compulsory health insurance applicable to practically all wage earners that would more equitably distribute the burden of the cost of sickness."

"Where doctors disagree—?"

The difficulties are again emphasized by the fact that the commission appointed by the Pennsylvania legislature after more than a year's work asked for two years additional for further investigation.

No matter how attractive the theory of health insurance may appear, the problems it brings up are too vast and intricate to be answered dogmatically.

Mr. Isadore Stern of the Pennsylvania commission puts this idea very well: "If a system of health insurance can be devised that will satisfy the employer and not humiliate the employe by compelling him to go to a physician he does not care to go to; if such a system can be inaugurated at a reasonable cost, and will not stifle individuality among physicians and will not be paternalistic, then it should be established; on any other basis it would be contrary to common sense."

Dr. Otto P. Geier* so fully agrees with some of the ideas I have tried to emphasize and he expresses them so forcibly that I cannot refrain from quoting him at length:

"Are we not assuming the same negative attitude toward the movement for better organized application of group curative medicine? Are not the physicians practically being ignored by the framers of compulsory sickness insurance? And yet we shall all admit that the future of scientific teaching of medicine as well as its economic practice will be absolutely determined by the enactment of such a law. Unless the profession comes out of its social, or rather unsocial torpor, we may be sure that such legislation will be made to fit the whims of the perniciously active reformer, whether or not it pleases us or benefits labor or capital. Here again we shall have permitted industry unaided, to visualize ahead of us the necessity of a constructive, preventive health program, as an integral part of any intelligent legislation for health insurance. How can we understand and contribute to economic and social legislation unless we get a new view of the problems of industry? Can we do this best merely by prolonging our scientific discussions in sequestered places, or by also entering into the life and understanding of industry.

"We must recognize that almost all old standards of thinking are in the discard. We are passing through a period of unstable thought. It behooves us as a profession to take inventory and better fit ourselves for this national reconstruction.

"It is for the medical profession at large to determine what place it will hold: whether in the swift current of thought, or in the quiet eddies; whether to stay on the edge of life, or close up to the great melting pot of human experience; whether to remain as spectators, or join in the struggle of progress; whether to rest in billet, or press on to the firing line where men are fighting for life's goal."

The medical societies of Wisconsin and Pennsylvania have indorsed health insurance "in principle." Thus they have put the seal of approval upon the idea but leaving the details to

*Surg. Gyn. Obst., Jan., 1920.

be worked out by the investigations and study, in which I am urging that the medical profession shall take a really intelligent part.

In closing permit me to say that we shall fail of our own full duty if we do not recognize the fact that ours is a profession and not a business only. We must look upon our profession not as a business alone but as a calling as well which in itself implies public service. We must realize that the public is so vitally interested in the practice of medicine that, in many ways, it is more or less of a public utility, which means that our decisions must at all times take the public into consideration and into our confidence, otherwise we may have to submit, as public utility corporations do, to public control which will give better results by mutual understanding and concessions than by compulsion.

There ought to be a common ground where radical and conservative can become more moderate. If this is not possible we will be faced with the danger of "state socialism", which is gradually growing in strength whether we acknowledge it, or not. The socialist and his unwitting ally, the chronic social reformer, the superficial theorists and the demagogues will settle these questions for us and settle them wrong, unless we make common cause with the saner elements of society, who will be careful to see that justice is done to the employer, the employe, the public and the physician.

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A CLINICAL STUDY OF 83 GASTROJEJUNAL ULCERS: DIAGNOSIS VERIFIED AT OPERATION*

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The primary object of this paper is to enumerate the salient clinical features associated with gastrojejunal ulcer in the hope that it may be of use to others interested in this difficult field of gastro-enterologic diagnosis. Valuable contributions to the subject have been made by von Key, Paterson, von Roengen, Lieblein, Moynihan, W. J. Mayo, C. H. Mayo, Carman, Balfour, Butsch, and others.

The series of cases of gastrojejunal ulcer herewith reported consists of two groups. In Group 1 are forty-seven cases which followed gastro-enterostomy performed in the Mayo Clinic for benign duodenal or gastric ulcer, and in Group 2 are thirty-six cases in which the primary operation was done elsewhere.

It seems expedient to preface the consideration of gastrojejunal ulcers with a brief review of the factors underlying a recurrence of symptoms following gastro-enterostomy. The operation performed by a surgeon of recognized ability for juxtapyloric benign ulcers is one of the most satisfactory in the domain of surgery. One must not lose sight of this fact. The various reasons or causes for disappointment or failure after gastro-enterostomy are as follows:

1. In our experience about two-thirds of the surgical failures occurred in the cases in which operation was performed in the absence of a lesion intrinsic to the stomach or duodenum. This is evidenced by the fact that my surgical colleagues have undone more than 300 gastro-enterostomies performed elsewhere, and about forty performed at the Clinic during an earlier period. Ulcer-bearing patients of the psychoneurotic type, or of the asthenic type, whose predominant symptoms are of neurotic origin often fail to obtain complete relief [5].

2. Among the defects in technic which are responsible for the failure of a smaller number of patients to obtain relief are a stoma that has been made too large or too small, or is im-

*Presented before the Southern Minnesota Medical Association, Fairmont, Minn., June, 1920.

Fig. 1. Old gastro-enterostomy with inflamed area on serous surface.

properly placed, a long jejunal loop, improper application of the jejunum to the stomach so that the direction of the proximal short portion of the jejunum is from left to right, and other surgical shortcomings.

3. A lack of thoroughness in operating, such as neglecting to remove a diseased gallbladder or an appendix at the time of an otherwise successful operation, or to deal directly with an ulcer-bearing area when circumstances warrant it may be the cause for incomplete relief[9].

Symptoms of a painful nature identical with or similar to the original complaint, may reappear at variable periods following operations or the original symptoms somewhat abated may continue after operation. The causes underlying the recurrence of symptoms are gastrojejunal ulcer, reactivity in the original partially healed or unhealed ulcer, carcinomatous changes in a chronic gastric ulcer, or the formation of a new ulcer in the duodenum or stomach. To a lesser degree, adhesions from natural causes in the region of the pylorus, or as the result of too much manipulation or repeated operations, cripple gastric function and provoke distressing symptoms. It is in these postsurgical types that the greatest difficulty is encountered in determining the factor or factors underlying the complaint. This is especially true in the early stages of the trouble when thorough medical or surgical treatment promises the most, and when combined clinical and laboratory diagnostic procedure is not sufficiently informative.

Successful differential diagnosis presupposes a thorough knowledge whenever possible of symptoms and conditions existing before operation, during operation, and after operation, especially with reference to whether or not an ulcer actually existed, whether gastro-enterostomy was done, or whether some procedure was also carried out on the ulcer or pylorus. Any difficulties encountered during the operation or immediate postoperative sequelae have especial significance. In the absence of reliable information the physician is thrown on his own diagnostic resources. In the examination special attention is paid to hyperacidity and hypersecretion, the emptying capacity of the stomach seven to twelve hours after a Riegel meal, blood in the gastric extract and feces, palpable masses, and visible peristalsis. In experienced hands the combined fluoroscopic examination and roentgenogram of the gastroduodenal area is an increasingly valuable diagnostic aid and frequently furnishes invaluable evidence as to gastric peristalsis and motility, the patency of the pylorus, the status of the original area of ulceration, the condition of the stoma and the presence or absence of new ulcers (Fig. 1).

Gastrojejunal ulcer is a formidable complication of gastrojejunostomy; its incidence is estimated at from 2 to 3 per cent. In 3,700 gastroenterostomies for benign ulcer in the Mayo Clinic gastrojejunal ulcer was the cause of a secondary operation in forty-seven instances, or in less than 1.3 per cent. This probably does not represent all the gastrojejunal ulcers that have occurred because some have been operated on or treated elsewhere, others have given rise

to disturbances for variable periods after which they have healed spontaneously, and a small number of untreated ulcers are still giving trouble.

So far the actual cause of the lesion has not been definitely determined. From our experience it has appeared that the use of unabsorbable suture material such as linen or silk is a highly important factor. Stitch ulcers continue to develop, however, though with greatly reduced frequency, since the exclusive use of chromacized catgut sutures. Other causes to which they have been ascribed are the inaccurate apposition of mucous membrane, the bruising of the portion of viscera embraced by clamps, interference in one way or another with the local blood supply, continuance of the cause, whatever it may be, of the original ulcer, and a persisting hyperchlorhydria. Immediate and remote factors frequently unfavorable to ultimate surgical success are always present. Hyperacidity and hypersecretion and pylorospasm and disturbed motility are known to make their reappearance by virtue of temperament, dyscrasia, vagotony, or indiscretion, and to work mischief. When it is considered that ulcers of the stomach and duodenum are largely embolic infections from some distant focus of infection[16] a failure to remove such foci undoubtedly favors recurrence of ulceration. Flint and others have shown that the anastomotic area is the site of a healing ulcerated surface for a period of at least fourteen days. In view of this fact it is reasonable to assume that the traumatizing effect of bulky or coarse food ingested soon after operation might predispose to ulceration at the new stoma. We have perceived no permanent ill effects, however, in a large series of cases in which a fairly generous diet was allowed from eight to ten days after operation. A careful routine postoperative management is nevertheless invariably of advantage to the patient (Fig. 2).

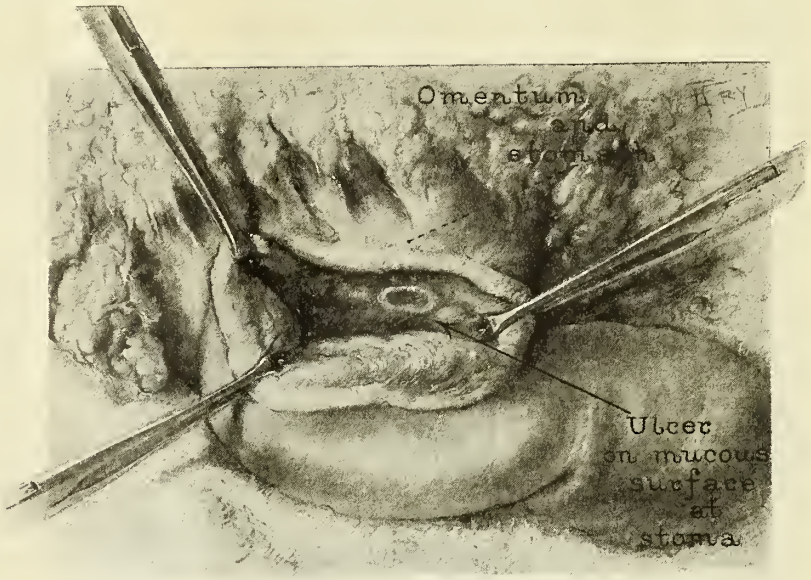

Fig. 2. Old gastro-enterostomy opened to expose ulcer (callous type).

While gastrojejunal ulcer furnishes no syndrome which differs materially from that of ordinary ulcer, a consideration of its surgical pathology may explain some of its clinical features or departures from type. The lesion does not usually have a crater and morphologically it is more like the saddle ulcer of the stomach. Rarely it is of the moth eaten, erosion type, with little inflammatory reaction. The process often involves the distal segment of the anastomosis opposite the stoma and spreads superficially, especially over the gastric area neighboring the ulceration and may involve the entire stoma. The base of the ulcer is usually in the transverse mesocolon, it may involve the colon, or rarely may penetrate it, in which case a gastrocolic fistula is formed, or the ulcer may point outwardly with its base in the abdominal wall, where the inflammatory mass or abscess is apparent. The mass is more accessible in cases in which an anterior gastro-enterostomy was performed originally. As in cases of the ordinary chronic ulcer, subacute or chronic perforation, or abscess formation or hemorrhage is a frequent complication. At times it is the cause of severe pain, local soreness, tenderness, or tumefaction. Induration or scarring, contraction, or extensive adhesions about the anastomotic area, involving both the stomach and distal limb of the jejunum, is

routinely noted by the surgeon. The stomach is usually large in the obstructed cases. Occasionally the patient may complain of pain on turning or twisting the body, raising the arms, or during a lifting strain, and this symptom is usually evidence of adhesions involving the abdominal parietes. By virtue of the location of the gastrojejunal ulcer, the subjective pain and objective mass or tenderness are frequently situated lower than before operation. At times the ulcer is almost entirely within the jejunum, although the suture line is invariably implicated (Fig. 3).

Fig. 3. Adhesions separated to reach ulcer site.

CLINICAL FEATURES IN THE SERIES OF FORTY-SEVEN CASES

Our own series of forty-seven cases will with few exceptions be discussed apart from the thirty-six cases in which the original operation was done elsewhere. In our cases a uniform gastrojejunostomy was done for a definite, demonstrable lesion. In only two was an anterior gastro-enterostomy performed. Forty of the patients in our series were males. There were thirty-three males in the series of thirty-six patients, making a total of seventy-three males to ten females in the two groups. In primary benign chronic gastric and duodenal ulcer the average ratio is about three to one, so that in gastrojejunal ulcer the sex ratio is more than doubled.

The forty-seven cases in our series seem to fall into four main types: (1) The regular ulcer type in which the postoperative complaint is identical with or similar to the symptoms of the original ulcer; (2) the irregular ulcer or gastric ulcer type; (3) the purely intestinal type; and (4), the complication type characterized chiefly by obstruction, perforation, or by a sudden onset of hemorrhage, single or repeated, without any antecedent pain feature, not unlike conditions obtaining in a small group of primary ulcers.

In Type 1 are twenty cases in which the symptoms were identical with, or similar to, the original complaint in that the clinical course was marked by periods of exacerbation alternating with relief, the pain or distress and associated symptoms bearing a definite time relation to alimentation, with regular and consistent relief by food, alkalies, and lavage. One significant difference was the fact that ten

patients volunteered the information that the pain was lower than formerly, usually at the level of the navel, to the left of it, or in the hypogastric area.

In Type 2 are twenty-one cases recorded as the irregular-ulcer or gastric-ulcer type since the time of appearance of the symptoms and their control was more variable and inconstant, the exacerbations tended to be more frequent although briefer than those characterizing the ulcers of Type 1 without complete periods of relief. In six of this group the preoperative syndrome was moderately irregular. But throughout the histories the relationship between food intake and discomfort, although not clearly definite, is sufficient to point to an intrinsic gastric lesion as the underlying cause[4]. Therefore in 41 of the 47 cases (87 per cent) the train of symptoms was such as we associate with chronic callous ulcer. In nine cases of this type and ten of Type 2 (22 per cent) or 40 per cent for both types the location of pain and tenderness had assumed a lower position. The onset of symptoms is usually gradual, the course, as a rule, rapidly progressive in the untreated cases, tending to become continuous earlier than in primary ulcer.

In Type 3, the purely intestinal type, there were two cases, in which the symptoms bearing no relation to food consisted largely of pain referred to the lower abdomen associated with bloating or defecation, occasional diarrhea, or severe constipation alternating with diarrhea, at times presenting a picture identical with intestinal obstruction.

In Type 4 were four cases, in which the characteristic pain or epigastric discomfort was absent. In three of the cases there was recurring melena, and in the fourth nocturnal vomiting of retained food, and severe constipation (Fig. 4).

The time of onset of symptoms after gastroenterostomy is of interest. Thirty-five per cent of our group of patients had a recurrence of symptoms within six months; 56 per cent within a year, and 88 per cent including the patients who experienced only partial or no relief, were complaining within one year after the original operation. In the group operated on elsewhere the percentage was about the same; in ten cases clinical evidence of a pre-existing ulcer was scant, and in twelve cases (33.3 per cent) no scar or other signs of the ulcer were found at the second operation. This, among other factors, permits the inference that the cause of gastrojejunal ulcer is largely some defect in the operation.

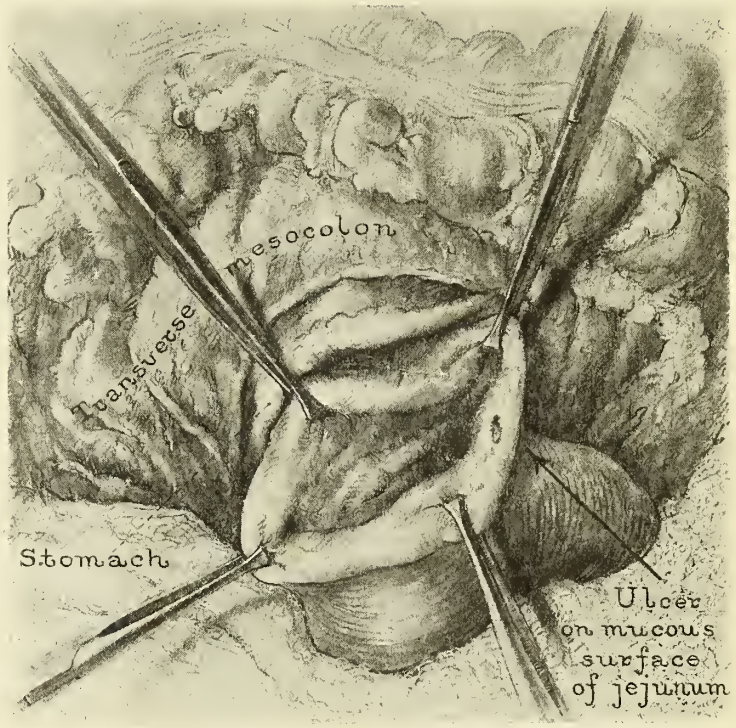

Fig. 4. Mesocolon dissected from gastro-enterostomy and opening made into mucosa. Erosion type of ulcer.

By the gastric analysis hyperacidity was found to be present in 60 per cent of the cases, and hypoacidity in only two cases. In the remainder the acidity was about normal. Twelve hours after a motor meal food residues in variable amounts were noted in eight of forty cases tubed, or in 20 per cent. Altered blood reactions in the gastric extract were strongly positive in ten (25 per cent).

Visible peristalsis was apparent during physical examination of the patients with marked

obstruction. Tenderness was localized or diffused in all instances. A small mass was definitely palpated in six cases, and suspicious in two others. With one exception the location of the tumor was at or to the left of the umbilicus.

Gross hemorrhage by the mouth, or bowel, or both, was recorded in eleven cases. In only two had there been bleeding prior to the first operation. Thus the occurrence of late hemorrhage after gastro-enterostomy for an ulcer that had not bled previously is strong evidence for gastrojejunal ulcer. In cases of marked anemia without frank hemorrhage occult blood was usually found in the feces, which is of equal diagnostic import. The majority of the patients were considerably under weight; they had had active daily symptoms ranging for from three weeks to seven months prior to examination. Extensive dental repair, severe pyorrhea, or dental caries was the rule rather than the exception.

Linen or silk sutures were found to have been retained in fourteen instances. In ten the strand or loop was found in the line of suture at the ulcerated area, and seemed to be the causative factor. The original ulcer was healed as a soft scar, or had strictured in the process of healing, causing marked obstruction to the outlet. One strictured area was reported as 1¼ inches in diameter. Reactivation of the old ulcer, probably the result of disturbed motility and hyperacidity, was evident at the time of the secondary operation in eight cases, while a new indurated duodenal ulcer had formed in three cases. Stricture caused by the healed ulcer, and edema and spasm of a new ulcer, pyloric occlusion done at the original operation in conjunction with contraction of the stoma, explained the cause of marked gastric retention in these cases.

TYPES OF OPERATION

The nature of the operative procedure, obviously difficult at all times, depended chiefly on the conditions found and in a measure on the technic most frequently employed by the surgeon. The gastrojejunal ulcer and any reactivated or new ulcer was excised in all instances by knife or cautery, and one of four procedures followed:

1. The gastro-enterostomy was cut off, the openings in the jejunum and stomach were closed, and some type of gastroduodenostomy carried out (eighteen cases).

2. In cases of a patent pylorus and duodenum the gastro-enterostomy was cut off and the opening in the stomach and the jejunum closed (thirteen cases).

3. A plastic operation was performed on the former gastro-enterostomy, or in other words, the old gastro-enterostomy was established after excision of the ulcer (thirteen cases).

4. The old gastro-enterostomy was cut off and a new gastro-enterostomy made (three cases).

No one method has any inherent advantage. The operative mortality was 5.5 per cent. About 65 per cent of the patients were cured or satisfactorily improved.

Gastrocolic fistula developed in two cases. Lienteric stools, diarrhea, stercoraceous odor to the eructations, feces or intestinal flora in the gastric contents, and nutritional disturbances were clinical characteristics. A barium meal or clysma will confirm suspicions of a communication between the stomach and the transverse colon. The precaution should be taken to wait for from ten to twenty minutes after the administration of the barium before plates are made, if earlier roentgenographic examination is negative.

CLINICAL FEATURES IN THE SERIES OF THIRTY-SIX CASES

In the series of thirty-six cases in which the primary operation had been done elsewhere a secondary operation had been done in thirteen cases for an immediate postoperative complication, or later for "adhesions" about the new outlet. In at least ten of the cases the characteristic preoperative history was lacking, and in a considerable number gastric analysis or fluoroscopy had not been done.

In thirty-four of the thirty-six patients in whom the preoperative history was recorded, five stated that their symptoms were identical with the original trouble; in sixteen the symptoms were similar, and in thirteen they were different. In general it may be said of this group that those with good evidence of ulcer existing prior to the operation had a fairly regular ulcer type of recurrence; those with

an irregular preoperative ulcer or functional picture had a similar irregularity postoperatively; those with a different syndrome were patients in whom gross technical error, intestinal or other complications were found. In thirteen (36 per cent) unabsorbable suture material was found in the ulcer area or suture line. Gross technical error was found in eight cases, chiefly a long jejunal loop turned in the wrong direction (left to right). In one instance, through error, a gastro-ileostomy was done, necessitating an entero-anastomosis nine days later because "the stomach did not empty". In twenty-four (67 per cent) relief was experienced for a variable period after operation; in twelve there was no relief or only partial relief.

Twenty-two (73 per cent) of the thirty patients whose condition permitted tubing had hyperacid gastric contents. Anachlorhydria was found in three, in each of whom only one gastric analysis was made. A palpable mass was found in seven (20 per cent). In eight the pain was definitely lower than with the original ulcer. There was a history of gross hemorrhage in fourteen (39 per cent), but seven of these had bled prior to the original operation, so that in the remaining seven the hemorrhage seemed incident to the secondary ulcer. The average loss in weight was 18 pounds. Reactivation of the old ulcer was definite in seven, and probable in two. In twelve instances no evidence of a preexisting ulcer was demonstrable. Gastrocolic fistulas were present and repaired in two cases. Recently I observed such a case in which there were no premonitory symptoms of ulceration. There had been no pain, discomfort or gastric disturbance prior to the onset of fecal vomiting, frequent bowel movement of undigested material, and rapid loss in weight.

Forty-five per cent of the thirty-six patients in this series were cured or improved. One reason that the percentage of cures in this series is lower than in our series is because the patient is merely restored to his preoperative condition after the gastro-enterostomy is cut off, or a pyloroplasty is done under unfavorable conditions.

DIFFERENTIAL DIAGNOSIS

In the differential diagnosis of these cases it is necessary to exclude the most probable factors, such as reactivation of a partially healed or unhealed ulcer, a new ulcer, or, in case the ulcer was originally gastric, the rare possibility of malignant degeneration in the presence of a gastro-enterostomy. All painful recurrences should be regarded from the standpoint of a gastrojejunal ulcer, and this lesion should be excluded first as the underlying factor. While clinical history, gastric chemistry and the physical examination, or the results of medical management may reveal an ulcerative process, its location may be surmised only. In the presence of gross retention or a palpable mass in the region of the umbilicus the evidence seems sufficient to allow an unreserved diagnosis of gastrojejunal ulcer. If the area of pain has assumed a lower level, especially in the left umbilical quadrant, it is valuable contributory evidence. Bleeding, gross or occult, in the absence of prior hemorrhage, incomplete or temporary response to intensive treatment, and a marked progressiveness of the clinical course, are features which strengthen the possibility of gastrojejunal ulcer. In the first and second types of ulcer with low pain and in the so-called intestinal type, the error of interpreting the symptoms as due to "irritable colon", colitis, or other similar conditions should be guarded against. In about half of all the cases the patient complained of radiation of pain to the lower abdomen to one or both ileac fossae. This area of radiation is infrequently observed in primary ulcer. The frequent involvement of the transverse colon, jejunum, and occasionally the ileum, seems to be the plausible explanation of the mild and the more severe evidences of intestinal disorder.

ROENTGEN EXAMINATION

The roentgenologic findings are of primary importance and often render a diagnosis conclusive. Carman calls attention to various phenomena in the presence of a gastrojejunal ulcer, among which are deformity of contour about the stoma, exaggerated peistalsis, gastro-enterostomy not freely patent, barium retention, and spasticity or enlarged stomach. In our series of forty-seven cases, of which forty were studied by the roentgen-ray, an unequivocal diagnosis of gastrojejunal ulcer was made in eighteen, and incomplete but contribu-

tory evidence was found in fourteen, or in a total of 80 per cent. The findings were negative in eight (20 per cent). In the thirty-six cases in which the primary operation was done elsewhere and in all of which fluoroscopy was done, the positive and contributory diagnosis was made in more than 55 per cent. It is of interest to note that in three cases (Cases 21303, 96188, and 249903) no gastro-enterostomy was seen in the fluoroscope, although the stoma at the time of operation was of normal size in two, and contracted to one-half normal size in the third case. Such an examination should be repeated if there is good reason to believe that a stoma exists.

CONCLUSIONS

1. Gastrojejunal ulcer is a formidable cause of recurrence following gastrojejunostomy, and occurs in from 2 to 3 per cent of cases; in 1.3 per cent of our cases a secondary operation was performed for the condition.

2. The ratio of males to females is 7 to 1, which is two and one-half times greater than the sex ratio in primary ulcer.

3. The cause of this lesion is largely due to technical error or mechanical defect in the operation itself. In one-third of all the cases retained unabsorbable suture material was a highly probable causative factor.

4. The symptomatology closely approached that of benign ulcer in 87 per cent, which comprise the regular and irregular ulcer types. The remainder are included under the intestinal and complication types.

5. Eighty-eight per cent of the patients, including those who obtained incomplete or no relief, had a recurrence of symptoms within one year after the original operation.

6. Late painful recurrence is frequently due to a gastrojejunal ulcer. Other possibilities to be ruled out are reactivation of the original partially healed ulcer, new ulcer, and malignant degeneration in a gastric ulcer.

7. Clinical features of diagnostic importance are as follows: (1) gross gastric retention, (2) small movable mass in the region of the umbilicus, (3) postoperative pain assuming a lower level, (4) gastrocolic fistula, (5) bleeding, gross or occult with associated anemia in the absence of preoperative hemorrhage, and (6) a progressive course and lack of satisfactory response to medical treatment.

8. Exact preoperative localization of the ulcerative process is only possible through the cooperation of the roentgenologist. The roentgenologic examination furnished reliable direct or contributory evidence in 65 per cent of all cases.

9. Careful operative technic combined with immediate and continued postoperative medical management should greatly reduce the incidence of the lesion. Medical participation under any circumstance in addition to the removal of foci of infection insures satisfactory surgical end results.

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DISCUSSION

DR. HUGH S. WILLSON, Minneapolis: This paper of Dr. Eusterman's is extremely interesting to those of us who are doing gastroenterological work.

We are constantly coming in contact with gastro-enterostomized patients who are having post-operative trouble: either a recurrence of the original symptoms or the development of new symptoms.

These conditions are extremely difficult to interpret oftentimes and the real underlying causes are not yet worked out.

The literature on the subject of gastro-jejunal ulcer is rather scant. Wright in the January, 1919

number of the Boston Medical Journal reported some 170 cases from literature. I believe the series presented by the Mayo Clinic is by far the largest from any one group and it is my opinion that the facts underlying these conditions will have to be worked out by the Mayo Clinic and similar bodies, where the medical and surgical care of the patient is under complete control of the one organization.

The points in this paper that have interested me particularly are in reference to gastro-jejunal ulcer. The causes of such is a fertile field of speculation. We know that in all probability non-absorbable suture material acting as a chronic irritant is an important factor but ulceer occurs also where such has not been used.

It would seem that the idea as expressed by Patterson might account for this condition: that is, the action of gastric juice on an unaccustomed mucous membrane. Attention has been called to the fact that ulcer is of more frequent occurrence in the long loop operation and especially in enteroanastamosis where the stomach secretion is not so thoroughly mixed with bile and pancreatic secretion before coming in contact with the distal mucous membrane.

I believe that to a certain extent the cause of gastro-jejunal ulcer would be the same as the primary lesion. This has not been worked out.

Among the gastroenterostomized patients I have seen there have been three cases which I considered gastro-jejunal ulcer but they have cleared up on management, and without the surgical demonstration of such ulcer I can not be sure that my diagnosis was correct. Where the stomach has been interferred with surgically it is much more difficult to make a hard and fast diagnosis.

While I have considered X-Ray my most valuable diagnostic help in gastric and duodenal ulcer, I have not been able to place so much confidence in it in past operative cases on account of deformity caused by surgical procedure.

Motility, definite tender points, also patency and size of the stoma under the screen are the most important findings.

Stomach chemistry is also affected by the new routing of duodenal contents and is not of much value.

My impression is that we are hearing considerably less of our gastroenterostomized patients than we were three or four years ago, probably on account of better technic and a better selection of cases. Also more attention is paid to post-operative diet.

While the three Ps, Powders, Pump and Pap have gained considerable noteriety from a recently published paper, I believe that correct management to the best of our present knowledge should be tried in all post operative as well as non-obstructive ulcer cases and there has been no management suggested that would take the place of the one above referred to.

DR. L. G. ROWNTREE, Rochester: It is not an easy matter in some cases to decide between medicine and surgery in gastric and duodenal ulcer. As a rule, these cases at first are medical, and after they have had a number of "medical cures" they become surgical. After operation for gastric or duodenal ulcer a patient should be returned to the physician for medical treatment and care.

It is interesting to hear from Dr. Eusterman, first, that most of the recurrences occur within the first year, and, second, that a very large per cent of his cases exhibited hyperacidity after gastro-enterostomy. It seems to me that these facts indicate that medicine and surgery should get together in the handling of cases, since, in many cases subsequent to operation, the patient needs just the same type of medical treatment that he was subjected to in one of his former "medical cures". If, during the crucial year, adequate medical supervision were given these patients, I believe that, unquestionably, the ultimate results would be much better.

DR. R. E. FARR, Minneapolis: I have been interested in some work done by Coffey of Portland, Oregon, in relation to the possibility of trauma as a cause of jejunal ulcer, in which he recommends doing away with pressure in performing gastroenterostomy. It seems to me that is an important point. When we put on clamps I think we would find necrotic areas in the mucous membrane, if the intestines were opened. Whether or not there is anything in the selective action of bacteria, as brought out by Rosenow, I do not know, but we certainly do, by the use of clamps, produce an area of lessened resistance and, if these bacteria have a selective action, we have good reason to believe they may locate there.

My notion is that a large number of patients are gastroenterostomized that should not be. I believe that gastric ulcer is going to be found to be largely a medical condition which can be cured without surgery. In following Dr. Sippy's work very closely, by visiting his clinic and being associated with his assistants, the point has been forcibly impressed upon my mind, that we should judge a method of treatment by the very best fruit it will produce. The cases of ulcer which have been cured by this management are so numerous now that there is surely a great deal in the treatment. In the first place, all these patients become better, symptomatically, at once, and quite a percentage of them surely get symtomatically well. The fact that the treatment is not properly carried out, and we have recurrences, makes no difference. We must judge this method of management by its best fruit. If cures can be accomplished now, the future will improve the results.

Another point I would like to make, as brought out by Dr. Rowntree, is that every gastroenterostomized patient should receive the benefit of this management from men who are willing to familiarize themselves with it.

We have, in our work, reduced the number of cases upon which we operate—cases in which we have made a positive diagnosis of frank ulcer—to

cases of hemorrhage, cases of obstruction, cases which are possibly in the malignant age and stage (and that is the weakest point in the argument I am just making), cases which do not respond to proper management and to cases of perforation.

DR. J. W. ANDREWS, Mankato: I want to subscribe to what Dr. Farr has just said about these ulcers. A few years ago I felt that if I had to deal with a gastric or duodenal ulcer an operation was indicated and I did it unless it were refused. In later years I have changed my mind very materially, and I believe these cases are very largely medical.

Let us analyze some of the things that have been said here this afternoon by the writer of the paper. In the first place, in an ulcer of the stomach there is usually a high acidity, and the stomach does not empty itself well because of that. Why? Because the secretions of the duodenum are alkalin, and when too strongly acid, gastric secretions are being thrown into the duodenum. The bolus of food is thrown back, there is rebellion. There is retention of food and gastric contents may be retained beyond the six hours, which is good evidence of ulcer. If gastroenterostomy is performed in a case like that, what is the result? It is not long before the same hyperacid condition obtains that obtained before operation, and after a patient has gone through with all this operative treatment and has been subjected to hospital care the same symptoms recur. I feel confident, after some experience with the treatment of these cases, that in a large majority of gastric and duodenal ulcers operation is not necessary, and I believe the time is not far distant when these cases will be turned over to the internist and not to the surgeon.

DR. GEORGE EUSTERMAN, Rochester (closing the discussion): I have very little to add except to say that in a measure the discussion has veered from the subject matter to that of the best method of treatment for gastric and duodenal ulcers. That I have frankly described some relatively rare causes for failure after operation for benign ulcer should by no means discredit an otherwise advisable and superior procedure.

There were many interesting observations made by those who have discussed the paper, which are really a happy supplement to the paper itself. From the standpoint of the internist I wish to state a few of my own convictons. Every patient with gastric or duodenal ulcer should have the benefit of proper medical management, especially the young person with a brief period of trouble. The reason that patients do not get results from medical treatment is that treatment is not sufficiently intensive and consequently it has fallen into disrepute both in principle and practice.

There are certain cases in which operation is indicated immediately, namely in the acute perforating cases, those with complications such as advanced pyloric obstruction, hour-glass deformity, probable malignant degeneration, and severe recurring hemorrhage. For social or economic reasons it is often essential that an operation be done, and finally, if medical treatment has failed consistently, or proper medical management is not available, surgery should be undertaken. Probably the quickest results are obtained in the hands of competent surgeons and by intelligent postoperative management.

The x-ray diagnosis was of value in 80 per cent of our own cases, and in about 55 per cent of the cases in which operation was performed elsewhere. Of course this means expertness and considerable familiarity with the method. The reason the x-ray diagnosis was so accurate in our cases was we knew what had happened before.

THE SELECTION OF SUB-STANDARD LIVES

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This subject is one which is of keen interest to all life insurance medical directors. Some of older and larger life insurance companies have been insuring sub-standard lives for a great many years. Other and smaller companies, in increasing numbers, are gradually entering into this field of selection. A sub-standard life is one which presents some impairment or group of impairments which render that life ineligible for insurance at standard rates but should not deprive the family of the insured of the benefits of such protection as life insurance affords.

Naturally the local examiner for a Company is, as it were, the connecting link between the applicant and the medical director. It devolves upon him to furnish to the company he represents, a true pen picture of the individual case as he finds it. Again, the surgeon who may have attended the applicant for some surgical condition is often asked to supply data, (upon request of the applicant) to complete this picture. Likewise the internist or family physician is asked to supply data in connection with questions involving past illnesses for which he may have attended the applicant. With all the facts thus accumulated before him, it is the function of the medical director to select or to pass upon the risk.

Prior to the time when statistics regarding the mortality among different classes of risks

were readily available, selection was necessarily largely based upon the personal experience or judgment of the medical director. But with the advance in knowledge of the mortality among the various classes of risks, it became necessary for the medical director to have some knowledge of these statistics which were compiled by the actuaries of the companies. While it is true that the basis upon which the prospect of life is valued, in the presence of some abnormal sign, is often a matter of guess work, still I hope to show that this is not necessarily so in the present day. Sir William Gardner in discussing the matter in relation to heart murmurs, states:—"Whether any data can be procured that will enable our successors to deal with cases of extra risk—*we have none,* and so deal with them either by loading or rejecting or shutting our eyes". This statement to some extent is true as a reference to any text book to ascertain the prognostic significance of certain signs will demonstrate; and this defect in our knowledge hampers us at every turn.

As has been well pointed out by Sir James McKenzie, many patients with such diseases as gastric ulcer or appendicitis recover without operation. There are nowhere to be found clear indications when to operate and when not to operate. Some surgeons would remove every suspicious appendix, because, though they recognize that some are without danger, yet being unable to distinguish them from the dangerous ones, they prefer that the patient should not run the risk. What is this but an acknowledgment that they cannot assess the value of symptoms? When such a surgeon says the symptoms are not sufficient to serve as a guide, he but deceived himself; the data is there, but he is unable to interpret it.

Necessarily applications received by any company on lives range from extremely favorable to very unfavorable and it must be determined in which intermediate group or given group the applicant belongs. It is, therefore, evident that standards must be adopted in order to properly classify these different groups of lives.

In 1907 the Association of Life Insurance Medical Directors, following a discussion upon "Medical Selection," formulated plans for a thorough study of the various types of *supposed* medical impairments. While still at work on this vast undertaking the Actuarial Society of America in 1909 proposed that a joint investigation between the two societies be made, since it was realized that much more could be accomplished by their united efforts than by each society separately. The results of the investigation made by these societies was termed "The Medico-Actuarial Mortality Investigation." In this investigation forty-four of the leading old line insurance companies of the United States and Canada contributed their mortality experience. This experience was taken from the years of 1885 to 1908 inclusive, a period of twenty-three years and it is a surprising fact that this experience covered *ninety-seven per cent* of the total insurance in force in the United States and Canada in 1885, while in the year of 1908 these companies had *ninety per cent* of the total insurance in force of this country and Canada. It will readily be seen that the material used in this investigation represented approximately *all* the business of these two countries. This investigation, known hereafter, as the "M. A." Experience is, therefore, regarded as a very valuable guide in the selection of risks for insurance. The results of this investigation provide a basis for action, based on the experience of the companies on insured lives. It must be emphasized that these classes, so described and studied, were composed of applicants who obtained insurance at standard rates and were, therefore, the best of their class; otherwise they would not have been accepted. No sub-standard lives or rated cases were included in this investigation except cases treated as sub-standard on account of family history alone. Those cases which were limited to endowment insurance were not considered as sub-standard. Had these cases been offered sub-standard insurance instead of standard insurance the mortality experience would have been heavier as the more favorable risks would have exercised self-selection against the company; some of those confident that they were good risks would have refused sub-standard insurance, thus leaving in the class those more definitely impaired and thus providing a heavier mortality.

Sub-standard lives are insured in either of the three following ways:

1. By advancing the age, thereby raising the premium.

2. By charging extra premiums or money extra, which practically amounts to the same thing.

3. By insuring on the "lien plan" that is, setting a lien against the insurance so as to scale down the insurance for a period of years. In practice the lien is usually heavy in the early policy years and decreases as the policy grows older.

Every risk for life insurance involves a consideration of the following factors: (1) build; (2) family history; (3) occupation; (4) personal history; (5) physical condition; (6) habits; (7) moral hazard.

The underlying principle in the selection of lives assumes that the average risk accepted by a company has a value of 100 per cent and the selector uses this as a basis either to add to or to subtract from, according to the factors entering into the case, the final value or rating to be determined and expressed with relation to that standard. It will readily be appreciated that the selection of the so-called borderline and sub-standard risks often proves a puzzling but most interesting study.

It is astonishing to note how many seriously impaired applicants can now obtain insurance if they are willing to pay the price. I have recently been informed that at least one old line company is now insuring applicants who have undergone operation for carcinoma.

In taking up for discussion the various medical and surgical impairments it will be quite obvious to you that it will be impossible for me to discuss more than a very limited number of these classes. A thesis might well be written on any one of the subjects of which I shall speak.

In the study of the M. A. Classification, seventy-six classes of medical impairments were investigated. Of these I have selected but seven. Unfortunately up to the present time very little of the experience of the companies writing sub-standard business has been accessible, though recently some very interesting information has been given out regarding certain impairments. It is understood that the companies writing business of this character are experiencing favorable results based on the excess mortality expected and charged for.

EXAMPLE OF RATING—AGE THIRTY

On the Ordinary Life Plan, an advance of 6 yrs. in age covers 150% Mortality, this increases the Premium.....$4.57

On the 20 Pay Plan, an advance of 7 yrs. in age covers 150% Mortality, this increases the Premium..... 5.19

On the 20 Year Endowment Plan, an advance of 10 yrs. in age covers 150% Mortality, this increases the Premium.. 3.23

I shall now proceed with the discussion of certain particular classes of impairments the first of which is syphilis.

SYPHILIS

It is generally conceded that syphilities may be safely insured, with the proper increase of premium, as soon as it is shown that they have undergone sufficient treatment, but owing to the incompleteness of luetic history in insurance examinations, the proper rating is difficult to assess as the applicant is usually hazy in his recollection of the time of the initial lesion, treatment and symptoms. Obviously a Wassermann test conducted as we would like it, is not available or practicable nor is it under our control; and even if it were applicable, it is of doubtful significance as the presence of a positive Wassermann test is not regarded as a sure evidence of syphilis nor its absence as removing the possibility of syphilis, especially of the latent form. Warting of Ann Arbor believes that syphilis as a latent infection is present in thirty per cent of our population.

Death is rare in the first and second years after infection but increases progressively with the years and is particularly evident between the fortieth and sixtieth years, the presence of syphilis being masked by myo-cardial, vascular, renal or hepatic symptomatology.

There has been a tendency to regard applicants who have been treated with salvarsan as being favorable risks for insurance. I believe that it has been found most disappointing in cases of tabes and cerebral syphilis and that false reliance has been placed upon it. We must, therefore, modify our views and prognostic enthusiasm and question whether modern methods of treatment will materially reduce

the hazard of this class. It has been stated that a Wassermann test has no greater value than to indicate that the person is at the time of negative reaction free from the *active* manifestations of the disease. In the consideration of this subject by the M. A. Experience the classes divided as follows, produce the following ratios of actual mortality to that expected on standard lives.

Before proceeding to quote the mortality ratios experienced I might digress for a moment to touch upon the basis upon which results were compared in the M. A. Experience. When a particular group is studied, the number of deaths to be expected in a group of such size and duration, experience is computed on the basis of the standard mortality table and such number of expected deaths is then compared with the number of deaths which actually occurred in the particular class, under consideration. For example:—If the expected deaths are computed as 100, and the actual number of deaths are 140, the ratio of actual to the expected mortality would be 140 per cent.

In the M. A. Study of Syphilitic history the classes divided as follows produced the following ratios of actual mortality to that expected in standard.

Syphilis surely thoroughly treated, two years continuous treatment, one year freedom from symptoms.

a—One attack between three and five years prior to application (small group not published) 139%

b—One attack between five and ten years prior to application (467 lives exposed for a total of 3138 years) 174%

c—One attack more than ten years prior to application (500 lives exposed for a total of 2855 years) 217%

Syphilis surely, not thoroughly treated and syphilis surely, no details of treatment. (There were but few cases of the first class, therefore, these two groups were combined.)

a—One attack between five and ten years prior to application (322 lives exposed for a total of 2776 years) 284%

b—One attack between five and ten years prior to application (491 lives exposed for a total of 4103 years) 212%

c—More than ten years prior to application (754 lives exposed for a total of 6184 years) 129%

The death rate from pneumonia, diabetes and suicide was much higher than normal in this class. From locomotor ataxia, paresis and paralysis combined, the death rate was five times the normal. A group of cases more recently studied by one company doing a substandard business shows a mortality of 135 per cent (possibly due to modern treatment). From the above experience it must be evident that syphilitics, generally speaking are poor risks no matter how thoroughly treated. It is also evident that the earlier they are insured the better the risk and it would seem advisable that all of these cases should be so written that the insurance is off the books by age fifty.

FISTULA IN ANO.

(With or Without Operation)

In considering this subject we are at once confronted with the question as to whether or not we shall regard fistula-in-ano as being tuberculous in origin. Authorities differ radically in this belief. Melcheior believes sixty per cent of fistulae to be tuberculous; Elting—ten per cent; Bach—five per cent and E. G. Martin of Detroit, reporting on a large series of fistulae which he has operated and followed with complete pathologic examination, says that real tuberculous fistulae possibly run five per cent, notwithstanding the general opinion among the laity and medical profession to the contrary.

It would seem to us if an applicant with a history of fistula, were of good build and weight, good family and personal history as regards tuberculous infection, a fistula following an acute abscess and readily healing with proper treatment, may be ignored.

Referring, however, to the M. A. Experience in this class, it would seem that our conclusions were incorrect as the death rate from tuberculosis of the lungs was several times the normal in this class. A further study, as regards the relation of underweight and fistula, shows a ratio of 134 per cent, nearly one-half of the deaths being due to tuberculosis. Following is a summary of the M. A. Experience:

One attack within two years of application 120%

One attack between two and five years of application 136%

One attack between five and ten years of application 100%
Combined ratio..... 118%

ALBUMIN AND CASTS

The companies generally are much more liberal at this time than formerly in the treatment of this class of case. It must be generally recognized that many applicants for insurance will show albumin transiently, due to some indiscretion in diet, excessive exercise, posture, etc., who have no pathological condition of the kidney. This is borne out by the experience of the companies as shown by the following data; and in view of the favorable experience as shown by this investigation, the companies generally are more liberal in their treatment of such cases since published reports of this investigation have become available. It is now a common practice of *conservative* companies to accept at standard rates an applicant giving a history of albumin in the past, who can now furnish two authentic specimens of urine for home office examination with negative results. (This applies only to applicants under thirty years of age.)

The M. A. Experience illustrates that applicants having on examination albumin in the urine without casts show a mortality of 131 per cent. One finding of albumin, no casts within two years of application, 103 per cent; a combined experience shows a total mortality of 113 per cent.

In the case of my own company I am applying the following rule. Cases showing a faint trace or a distinct trace to Heller's test:

Age thirty to forty-five rate for.. 115 to 125%
Age forty-five and over rate to cover ..... 140 to 150%

Two or three out of three or four or more specimens, the last negative:

Under age thirty..... 140%
Thirty to forty-five..... 160%
Forty-five and over..... 175 to 200%

History of albumin, a casual finding on previous examination, no record of treatment and one year or more past, now clear on two or three specimens, standard.

Either granular or hyaline, no albumin, three to five on a slide in two or more specimens, 125 to 150%; more than five casts, 175%, and over fifteen casts, doubtful.

Transient albumin with casts, one positive albumin, followed by two negative, three to five casts on a slide in two or more specimens, in young adults:

Under thirty..... 125 to 150%
Age thirty to forty-five..... 140 to 175%
Age forty-five and over..... 165 to 200%

Slight to distinct trace to Heller's test in two out of three or more specimens and three to five casts on a slide in two or more specimens:

Under age thirty..... 165 to 190%
Thirty to forty-five..... 185 to 210%
Forty-five and over..... 200 to 250%

If more than five casts add twenty-five points to preceding. It must be remembered that most of the companies require home office specimens so that specimens may be examined in their own laboratory in a uniform manner. Obviously it would be impracticable so to instruct local examiners in the use of home office methods as to obtain required uniform results.

SUGAR IN THE URINE

From a life insurance standpoint it is very difficult indeed, to make a distinction between diabetes mellitus and glycosuria, the reason for this being that it is impossible for the examiner to give sufficient study to a case to enable him to say upon one examination whether or not the applicant is a diabetic or is simply a glycosuric. It has been the common custom of most of the companies to decline cases giving a history of sugar within two years of application, unless there was proof that the glycosuria had passed away or that a mistake had been made in the original examination of the urine. It is quite evident, of course, that it is most difficult in these cases to know whether the applicant is on a diet or whether or not he may have shown sugar on previous examinations. It has been the general practice of all companies to decline cases where sugar was found on examination unless it was found in but one of several specimens; even such a case is declined if there be a history of sugar having been found in the past.

Glycosuria may entirely disappear for long periods only to recur. Such periods of latency cannot be adequately estimated and the causes assigned for benign glycosuria are often associated with the development of diabetis mellitus.

An analysis was made by one company of one

thousand cases, insured at standard rates, during a period extending from 1896 to 1915. In these cases sugar was found on more than one examination. The following results were obtained:

Age at Entry	Actual Deaths	Expected Deaths	Ratio
15-24 inclusive.....	52	50	104%
25-36 inclusive.....	97	65	149%
40 and older.....	41	24.6	167%

In cases of glycosuria the relative mortality appears to be not **less** at older ages of entry than at the younger, as has been generally believed, but actually **greater.**

INFLAMMATORY RHEUMATISM

This subject from an etiological standpoint has had the "call" in medical literature during the past five years. Considerable knowledge has been gained and many theories worked out and demonstrated, attempting to attribute the cause of this malady to a specific organism whose chief habitat seems to be the tonsils, or if the tonsils are innocent, the teeth. Thus has followed a wholesale sacrifice of tonsils and teeth. Whether or not these measures will ameliorate this dreaded incapacitating disease and its serious sequelae (endocardial and myocardial disease), remains to be seen. Judging from clinical experience it would seem that we should expect a favorable mortality in applicants who have undergone a tonsillectomy.

The question arises as to whether an applicant giving a past history of inflammatory rheumatism should be considered a standard risk. It is my feeling that most physicians who have treated inflammatory rheumatism and its sequalae would hesitate to say that they could be so regarded. In the first place there is the very common complication valvular heart disease, and then again a tendency to recurrences of attacks which seem eventually to affect the heart. It is surprising, however, to see what a favorable mortality the companies have experienced in dealing with this class of risks. Again it must be emphasized that in this group only the most favorable cases were accepted and doubtless many of these cases which were *called* "rheumatism" were sciatica, various forms of arthritis, lumbagoes and other clinical conditions which could not be classed as true rheumatic fever.

The companies' experience covering a large number of cases shows the following ratios of actual and expected deaths.

A—One attack within two years of application	120%
B—One attack between two and five years prior to application.....	121%
C—One attack or more, the last within two years of application.....	123%
D—Two or more attacks, the last occurring between two and five years prior to application.....	109%
E—One attack at an indefinite time in the past.....	108%

It is my feeling that there would be a danger in accepting at standard rates all cases showing a history of inflammatory rheumatism irrespective of the time and duration of the attack and it is our feeling that uncomplicated cases of rheumatism within two years should call for a rating of 150 per cent. After two years have passed, with no recurrences or complications, the case might be accepted at standard rates. Two or more attacks, the last within two years should be rated 175 per cent and upwards. The last attack between two and five years, 125 to 150 per cent; the last attack over five years ago, standard. Should the ascribed cause be removed, i. e., the tonsils, the rating may be reduced thirty points.

The effect of the heart complications in this class will be considered under the heading of "Heart Murmurs."

PLEURISY

Frank pleurisy is always under grave suspicion on account of the possibility of the infection being of a tuberculous nature. This is true of healthy persons as well as those in poor health. It is now generally believed that some sixty to eighty per cent of all pleurisies are tuberculous. It is therefore felt that a sufficient period of time should elapse after an attack before the acceptance of such a risk at standard rates.

Subjects developing empyema are, of course, of a more serious character and should be more carefully selected than a simple pleurisy, or those with pleuritic effusions, unless the empyema occurs as a complication of lobar pneumonia.

The Medico-Actuarial Experience divided pleurisies into but two classes:

I—PLEURISY OTHER THAN PURULENT

II—PLEURISY PURULENT

Class I—(A) One attack within two years of application, mortality ratio, 147%.

(B) One attack between two and five years prior to application, 146%.

(C) One attack between five and ten years prior to application, 113%.

(D) One attack more than ten years prior to application, 92%.

It will thus be seen that the more favorable cases were those which were accepted a considerable time after the infection took place. When the pleurisy occurred within five years of application the relative mortality in the first five policy years was higher than in the succeeding policy years and it was also distinctly higher at the younger, than at the older ages at entry. The death rate from tubercuIosis was three times the normal expectancy. When pleurisy occurred between five and ten years prior to application, the death rate from tuberculosis was twice the standard, while if it occurred ten years prior to application it was normal.

Class II. The experience in this class showed six hundred thirty-six cases in which one attack of purulent pleurisy occurred within ten years of application. One attack within five years prior to application gave a mortality of 158 per cent. One attack more than five years prior to application, 104 per cent, which is practically a normal mortality.

It is to be hoped that in future analysis of this class a distinction will be made between pleurisy with, and pleurisy without effusion Whether, however, this will add anything to our knowledge is doubtful when we consider that in the groups studied, there is but 10 per cent difference in the first five insurance years between pleurisy non-purulent, and pleurisy purulent, the mortality of non-purulent pleurisy being 147 per cent; purulent, 158 per cent. It must be remembered also that these cases were the most favorable of their kind being most carefully selected.

In the light of our present knowledge it seems reasonable to regard all cases giving a history of pleurisy whether purulent or not, if within five years, as being sub-standard and requiring a rating of at least 150 per cent. This would be, theoretically, a proper procedure but it is not a practical one as the personal equation of the selector must necessarily vary and the standard of the mortality to be maintained, combined with business consideration seems to preclude the adoption of any such uniform plan.

HEART MURMURS

In the preceding groups presented we have dealt mainly with those lives which were regarded as standard and accepted as such. This experience should and does serve as a guide in our present selection of risks. In considering the group comprising heart murmurs we must at once consider these as strictly sub-standard. It includes only risks with single heart murmurs and without other impairments, except as otherwise referred to.

This is a study of the mortality experience of the New York Life made by Dr. O. H. Rogers on certain male risks regarded as sub-standard by reason of heart murmurs. This study included only those cases having no impairment other than the presence of a heart murmur. Where a slight irregular or intermittent pulse was shown with heart murmur, it was regarded as an expression of damage to the integrity of the heart.

Making due allowances for variations such as doubtful murmurs or questionable findings which would occur in any medical group studied, this experience should be of interest to scientific physicians as well as to medical directors.

In life insurance work the valves of the left side of the heart are of most importance as they are most frequently affected and are, therefore, of greatest interest. In order to obtain as definite a picture as possible of the existing condition a "heart blank" was employed. This was filled out by the examiner and in addition to a written description of the condition present, indicated graphically the location of the murmur and degree of cardiac enlargement, if any. This served the double purpose of stimulating the examiner to do his best, and also, enabled the company to estimate the value of his work.

Mitral regurgitant murmurs were subdivided into 7,025 cases showing mitral regurgitation

without hypertrophy, and 1,282 cases showing mitral regurgitation *with* hypertrophy.

MITRAL REGURGITATION WITHOUT HYPERTROPHY

Age at Entry	Actual Deaths	Expected Deaths	Ratio
15-29	135	79	171%
30-39	148	73.5	210%
40 and over	121	71	170%
	404	223.5	181%

Of these 149 or 37 per cent of the total deaths were directly attributed to organic heart disease. In a corresponding group of standard risks, the number of deaths from organic heart disease would be fifteen. The death rate from heart disease was ten times normal.

MITRAL REGURGITATION WITH HYPERTROPHY

Age at Entry	Actual Deaths	Expected Deaths	Ratio
15-29	41	19.5	211%
30-39	37	14.5	255%
40 and over	28	13.1	214%
	106	47.1	225%

Forty per cent of the total deaths were from organic heart disease. The death rate was fourteen time the normal.

MITRAL REGURGITATION WITH RHEUMATIC HISTORY

Unquestionably the belief that heart disease which accompanies or follows an attack of rheumatism is a very serious impairment is borne out by the experience of Dr. Rogers who shows that in a group of 1528 lives with the above impairment, a mortality of 300 per cent was experienced. Those where a hypertrophy was added showed a mortality of 455 per cent; seventy per cent of deaths were from organic heart disease a death rate *thirty* times that which would have occurred in standard lives.

AORTIC REGURGITATION

Owing to the recognized seriousness of this lesion but few cases were accepted. The 560 policies with 96 deaths gave a ratio of 440 per cent. Of these 180 cases with *hypertrophy* showed 600 per cent.

AORTIC OBSTRUCTION

Three thousand two hundred and eight policies with 227 deaths gave a ratio of 179 per cent. Thirty-two per cent of those deaths were due to heart disease. It was necessary to include in this class, cases with other impairments such as tuberculosis in family history, history of dyspepsia, etc. It was felt that this group must have included some cases of functional heart murmurs to have obtained such a favorable mortality as this.

FUNCTIONAL HEART MURMURS

There were 2622 cases in this group; average age was twenty-nine as functional murmurs are more frequent in young.

Age at Entry	Actual Deaths	Expected Deaths By M. A. E.	Ratio
15-34	54	56	96%
35 and over	34	21	162%

It would seem from the above experience which is a careful study of 15,000 cases of heart murmurs, that we have had an index as to how acceptable are cases having these impairments. These deal with men in all occupations, walks of life and surroundings and gives us a "yard-stick" with which to measure our prognosis by actual experience which could not be obtained in any other manner.

It may not be immediately apparent to you in just what respect such a discussion as this concerns you, as clinicians. Medicine as a science has in the past fifteen or twenty years made remarkable progress. This is particularly true in the field of diagnosis. Introduction of new instruments of precision such as the sphygomomanometer, and new methods such as the use of the roentgen rays in the diagnosis of diseases of the vital organs such as the heart, lungs and the gastro-intestinal tract, are refined procedures of technique as are the various tests for blood sugar, which have made possible a nicety in diagnosis which has previously been unknown, indeed, hardly dreamed of. Progress has also been made, through careful experimentation aided by the collection and analysis of data from various laboratories, in the field of treatment. Procedures are daily being carried out in the hospitals as well as in private practice which a few years ago were considered revolutionary.

Of the field of *prognosis*, however, as much unfortunately cannot be said. Too often our prognosis in a given case is based on an indefinite belief which is very often greatly modified by our hopes. It must, of course, be recognized that exactness of prognosis in a given case is impossible. But we should be able eventually to foretell with reasonable accuracy the future

of the average case in many diseases. That this condition is greatly to be desired will not be denied and that such prognostic ability will add greatly to the peace of mind of the physician as well as of his patient, will not be questioned.

Life insurance, both as a business and as a science, rests upon analysis of past experience and must in the nature of the case, to a considerable extent, resolve itself into an effort scientifically to forecast the future of life.

Few individual practitioners see enough cases to enable them to compile conclusive statistics. Moreover, the individual physician in a large number of his cases entirely loses track of his patient upon the subsidence of the acute condition for which he was consulted. Accordingly, we must depend upon statistics collected from such a source as the files of an insurance company for reliable knowledge of the influence of the various diseases and conditions upon the longevity of the individual. I have, therefore, felt that it is worth while to present to you this glimpse of the field of sub-standard insurance in the hope that it will give you a conception of the possibility of issuing insurance to the impaired individual.

I am sure that you will appreciate much more intelligently the close relationship which exists between the physician or surgeon who has treated an individual and the insurance company which is endeavoring to issue to that individual the most favorable policy possible. As examiners, your relationship is even more intimate, since upon the accuracy and completeness of the examiner's report, the company must largely base its action.

That everyone, who may safely be insured shall have insurance, is the ideal of the life insurance companies. Since the fundamental ideal of life insurance is protection for those who would, otherwise, be dependents, it is, therefore, not only in a sense, a duty, but should also be a pleasure to a physician to assist quate treatment from insurance companies.

THE WORK OF THE ROCKEFELLER COMMISSION IN FRANCE*

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The World War created a situation unprecedented in medical and sociological investigation, by permitting a social and medical experiment to be tried on virgin soil, so far as tuberculosis work was concerned. France, sorely beset by war conditions, was in no position to take up the question of tuberculosis and it was the opportunity and privilege of America, through the Rockefeller Commission, to step in and make a start on a large scale toward the solution of this problem.

As outlined from a preliminary survey, the Commission (headed by Dr. Livingston Farrand) decided to attack the problem as follows:

I. Legislative measures.
II. Educational.
III. Demonstration centers.
IV. Direct relief, in conjunction with the American Red Cross.

The legislative side of the work was begun by creating a sentiment for a law for compulsory registration of cases of active tuberculosis. As you will all remember, the early attempts to make similar state laws in this country were fought bitterly by medical men of myopic vision. The proposition was attacked as bitterly in France, but thanks to the courage of an enlightened group of medical men, aided by the efforts of Clemenceau, this measure was introduced in the Chamber of Deputies in January last, with highly probable chance of adoption. This measure, efficiently applied, will of course be the foundation stone of the permanent tuberculosis work in France. The focal areas will be discovered, an accurate death rate compiled, and the remediable and preventive forces more efficiently applied. Further legislative work included the organization of all health forces operating in France under one control.

The educational work was under the direction of Dr. Selskar Gunn and was divided into

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several groups. A traveling equipment consisting of auto truck, with cinema, a French director and adequate help, would permit each village or town to be well advertised of the object and purpose of this work. A meeting would be called and in conjunction with the city officials, interesting talks on public health, illustrated by clever health films, would be given. The following day, a meeting would be held with the local doctors and a tentative dispensary service commenced. The Commission would usually pay the original cost of the dispensary and equipment and the running expenses for the first year. The Commission also furnished a French nurse, trained in the American dispensaries in Paris.

The demonstration centers furnished an important part of the general medical scheme. This work was in charge of Dr. James A. Miller, later assumed by Dr. Bernard Wyatt. These centers were placed in the 19th Arondissment (or ward) of Paris, and in the Department of Eure et Loire an average agricultural section of France (France is divided into departments, similar to our State divisions). In Paris this ward had a population of 250,000 with a death rate of 469. This was not the worst ward in Paris. The 12th Arondissment had a death rate of 532. In the 19th Arondissment, three model dispensaries were opened, with a central laboratory. Later a large central dispensary was opened with x-ray, dental, nose and throat departments and a complete laboratory. American doctors were placed in charge of these dispensaries, with a chief nurse, and French girls were admitted as students. Later, as the work progressed, French doctors replaced the American personnel and the dispensaries were taken over by the municipality. The most important feature of the dispensary work was the training school for nurses. France had no trained nurses and the innovation did a great deal to break down the prejudices which had formerly kept the better type of French girls from engaging in nursing. In the department of Eure et Loire, a different scheme was followed. Here a central dispensary was started in Chartres, the capitol of this State; then three branch dispensaries in the three larger towns, and 15 branch dispensaries in the small villages. By means of autos, one day a week was devoted to each dispensary, the health nurses working on other days by visiting homes, giving advice, and following up cases. The service rendered by these young French girls was extremely valuable and a large degree of the success of the work depended on the personality of these young women.

At the commencement of the work, the great difficulty encountered was the hospitalization of the advanced cases. France had converted all available hospitals, schools and barracks into military hospitals. By making arrangements with the authorities, the poor farm was utilized, later a departmental sanitorium was started at Chartres, and at the end of the war, the local hospitals allowed a certain number of beds for these cases. The hospitalization resources were divided into three groups:

I. Those for advanced cases.
II. Those for curable cases.
III. Day camps, or preventoria for children infected but not actively tuberculous.

The entire scheme was linked up with the laboratory, x-ray and nose and throat service. When the organization was complete, the American personnel was replaced by local French physicians and the entire work turned over to the departmental officials, under control of the ministry of Health, under a subsidy granted by the Rockefeller Foundation.

An important part of the medical work as embodied in the nursing and medical service, was the active educational program carried out simultaneously. By means of health crusades, public lectures, booths at fairs, the churches, the health conscience was awakened and when that took place, opposition disappeared and the success of the work became manifest.

The active relief work, in conjunction with the American Red Cross, was in the form of financial aid for the tuberculous families, such as food, clothing, drugs, etc., and did a great deal to show the French we were ready to give more than advice.

The outcome of the work cannot of course be estimated at this time, but before I left France, a year ago, many departments were adopting the plan as outlined and worked out by the Commission. The medical work of the Commission was taken over by Dr. Kuss, one of the best known medical men of Paris. The

Freneh physieians were thinking of tuberculosis in terms of prevention rather than the hopeless attitude evineed by physicians not many years ago. The interesting part was the effort to projeet a scheme worked out along the lines found the best by American and English workers. Apparently, France accomplished in four years what it took America twenty years to do. However, this is not absolutely true, sinee the French public mind is not so alert to publie health problems as is that of America; but a few years more will give to France a decreasing death rate that will compensate in no small degree for her losses in the Great War.

America will never have need to regret her work in Franee along health lines. Disease is international. The high tuberculosis population of Franee was of vital interest to Ameriea. The intermingling of our soldiers with foreign soldiers and civilians did a great deal to increase the tuberculosis ratio among our soldiers. We are now seeing that in spite of rigorous examinations, tuberculous civilians were admitted to military service, or else a certain number of them were infected on foreign soil.

The resumption of immigration to Ameriea will bring into this country a group of people with latent tuberculosis, directly affecting the health and welfare of us all. The importance of the International Red Cross program is then brought home to us all and we are today realizing that politically, hygienieally and socially, Ameriea can no longer hold the old idea of isolation among nations. The health question of itself shows the fallacy of sueh an argument.

A STUDY OF THE HEREDITARY FACTORS OF EPILEPSY

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Practieally every person afflicted with epilepsy wishes to know if the disease is inherited, and if it will be passed on to the next generation. The question invariably is answered in the affirmative, although it may be diffieult to determine the origin of the condition in any particular case.

Strumpell, Church and Peterson, Oppenheim, and others, have considered heredity a very important factor in the etiology of the disease. Dieulafoy passes the matter over by saying that true idiopathie epilepsy is often hereditary. These authors do not present statisties to prove their statements. while those taking opposite views give more or less data to substantiate their elaims. Clark states that 20 per cent of epilepties present no evidenee of hereditary taint, either epileptie or neuropathic, and that in most eases epileptics do not beget epileptics. This is eonfirmed by Starr. Gray is of the opinion that heredity is a faetor in about one-third of the eases. Waters, who investigated thoroughly the results of marriage in twelve known epilepties found seven men to be the fathers of healthy ehildren, one woman to have healthy ehildren, one woman to have three ehildren with epilepsy, and three women to have no ehildren, showing transmission in one of nine marriages. Thom, in 1916, investigated the marriage of sixty-eight men and seventy women with epilepsy after having first studied their hereditary history. Direet heredity was found in seven instances; through the mother in three, and through the father in four; in one of the cases the transmission was both direet and indireet through the mother, maternal grandmother, and maternal great grandmother, four generations. Five and eight tenths per eent of aneestors had epilepsy. In the 138 marriages one person only with direet epilepsy heritage had epileptic offspring. Five hundred fifty-three children were studied. Ten ehildren had convulsions, two in one family; six of the ten died in infaney. In 6.5 per cent of the patients the epilepsy was directly transmitted. Starr diseussed the hereditary factors in 700 cases, and found epilepsy in a near relative in 136, or hereditary taint in 19.2 per eent of the cases. Echeverria, in 1880, studied 136 matings in epilepties, from whieh 533 ehildren were born. Of these 195 died in infaney with eonvulsions and seventy-eight were living epilepties; the total epileptic offspring was reckoned at 273 (51.2 per cent). This is probably the very earliest souree of the idea that there is a high degree of heredity in epilepsy. Eeheverria eonsidered an epileptic any ehild having a convulsion. Such an assumption is certainly not warranted among infants and

young children in whom the causes of convulsions are numerous.

The present study is composed of 128 cases of essential epilepsy that were observed in the Mayo Clinic during 1919. All the patients had normal or approximately normal blood pressures and negative Wassermann tests, and all had negative roentgenograms, in contradistinction to the 115 cases reported by McKennan, Johnston and Henninger, 80 per cent of whom showed bony changes about the sella. The examinations of the eye grounds were negative; in doubtful cases examination of the spinal fluid was made and found to be negative. In none of the cases was a cause for the convulsions found. Seven (5.4 per cent) of the patients had had convulsions when infants.

Ten and nine tenths per cent of the patients had a direct or indirect history of epilepsy in their families. One only had a child that was epileptic (Table 1).

TABLE 1

HEREDITARY FACTORS IN EPILEPSY NOTED IN 128 CASE HISTORIES TAKEN FROM GENERAL FILES

	Migraine	Insanity	Epilepsy	Not stated
Father	9	1	2	..
Mother	24	..	1	..
Sister	17	..	..	..
Brother	5	..	1	..
Both parents	6	..	..	..
Mother and grandmothers	2	..	..	..
Mother's uncle	2	..	1	..
First cousins	..	..	2	..
Mother's half brother	..	..	1	..
Great uncle	..	..	1	..
Mother's family with long history and many cases	..	..	1	..
Brothers and sisters	..	..	3	..
Father's second cousin	..	..	1	..
Aunts	4	2	..	..
Totals	69	3	14	42
	53.9%	2.4%	10.9%	32.8

Migraine was present before the onset of epilepsy, and alternated with or continued with epilepsy in eighteen (14 per cent) of the cases studied.

In comparing the sequential symptoms of migraine and those of convulsive epilepsy a striking similarity may be seen. It is frequently stated that migraine is capable of transmission by transformation, alternating with hysteria, epilepsy, and insanity. Hysteria was not recorded in the ancestry of any of the cases studied, and insanity was recorded but three times.

The relation of migraine to epilepsy has been particularly observed in the examination of patients in the Section on Neurology in the Mayo Clinic. In the case histories recorded in Table 2 definite notation was made of the presence or absence of migraine, whereas the histories taken from the files for Table 1 had been written before this study was made.

TABLE 2

HEREDITARY FACTORS NOTED IN 128 CASES OF EPILEPSY STUDIED IN SECTION ON NEUROLOGY

	Migraine	Epilepsy	No migraine nor epilepsy
Mother	34	1	..
Maternal aunt	1	..	..
Maternal grandmother	1	..	..
Mother and sister	5	2	..
Mother and one brother	3	..	..
Mother and maternal grandmother	2	..	..
Mother, one brother, and one sister	2	..	..
Mother, two sisters, and one brother	1	..	..
Mother and two sisters	1	..	..
Mother, four sisters, and one brother	1	..	..
Maternal grandmother, mother and aunt	1	..	..
Maternal uncle	2	1	..
Mother's half brother	..	1	..
Maternal cousin, mother, one brother, and one sister	1	..	..
Maternal grandfather	..	1	..
Maternal grandmother, mother, aunt and one sister	1	..	..
Maternal grandmother, father, and mother	1	..	..
Paternal grandmother and father	2	1	..
Paternal uncle and one brother	..	2	..
Paternal grandmother, father, and two brothers	1	..	..
Paternal grandmother and father	2	..	..
Paternal grandparents, father, and one brother	..	1	..
Father	7	1	..
Father and one brother	1	1	..
Father and mother	8	..	..
Father's second cousin	..	1	..
Sister	3	..	..
Brother	3	..	..
Daughter	1	..	..
Paternal grandmother	..	1	..
One uncle and one cousin	..	1	..
Nephew	..	1	..
Totals	85	16	27
	66.4%	12.7%	21%

Table 2 shows that 12.7 per cent of the patients had a direct or indirect history of epilepsy in their families. One only had a child who was epileptic.

Migraine was present before the onset of epilepsy, alternated with, or continued with epilepsy in thirteen (10.5 per cent) of the cases studied in Table 2.

Wilson is of the opinion that persons who suffer from migraine are frequently members of neurotic families in which epilepsy has occurred. Oppenheim states that a person who has suffered for a long time from migraine may become subject to epilepsy, an observation made in our series of cases. Vorkastner calls attention to an intimate relationship between migraine and epilepsy but fails to define the relationship. Litchy discusses the occurrence of migraine and epilepsy and urges further study of the subject. Mackenzie, however, is of the opinion that it is reasonable to assume

that there is no relationship between migraine and epilepsy.

The data in Tables 1 and 2 show a very clear relationship between migraine and epilepsy and no practical relationship to the so-called neuropathic diseases and insanity. The recorded low percentage of epilepties in the families of the patients warrant caution in telling patients that their children are very liable to epilepsy. Closer study should be made of patients with migraine, however, in order to determine whether they are the parent stock for epilepties.

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OBSERVATIONS IN EPIDEMIC CEREBROSPINAL MENINGITIS AT HOSPITAL CENTER, KERHUON, FRANCE

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Knowledge of the diagnosis and treatment of epidemic cerebrospinal meningitis was increased greatly by the experiences gained in dealing with the disease in army life, because of the wonderful opportunity afforded to study various epidemics under widely different conditions. It is hoped that this report, covering fifty cases, may be of interest in presenting the picture of an epidemic handled under unfavorable circumstances and in conveying some facts learned in detecting and treating these cases.

Base Hospital No. 65 took charge of the first hospital space to be opened at the hospital center at Kerhuon, about three miles from Brest, France, and was alone with the work until Base Hospital No. 105 arrived in early November. We came there on September 16th, 1918, and found that the hospital wards were not completed, there was nothing ready, in fact, except quarters for the officers and enlisted personnel. We were to operate as a sort of reservoir where the sick and wounded might be cared for until transports or hospital ships were available to take them home. The hospital was forced, however, on September 26th, to begin to receive influenza cases arriving from the States as all hospital space available in and around Brest had been filled to overflowing. This was three weeks before we were expected to open according to the plans and forced a tremendously difficult duty upon us. In a very few days we had about 1800 desperately sick men in our wards, with a total of about 18 medical officers available for ward duty. We had no paper for records, no sputum cups, practically no eating utensils, nothing for lights, except candles, but, fortunately, plenty of beds and warm blankets. There was a good source of supplies at the Quartermaster's depot, at Brest, and our needs were supplied as rapidly as possible. However, with each medical officer on ward duty in charge of about one hundred sick men, it was impossible to study cases carefully. There was also a corresponding

shortage of nurses and ward attendants. As a result of this lack of medical officers, and because of dealing with an influenza epidemic of such magnitude, which disease in itself was new to most of us, it is not surprising that many cases of unrecognized epidemic meningitis occurred. These patients were especially susceptible to meningitis as they were suffering from an influenza infection which lowered a resistance already weakened by a long ocean voyage on a crowded transport. Finally, it seemed that we were on the verge of a perfect deluge of these cases as we began to have deaths from meningitis in every ward almost, and most of these were unrecognized as such and mistaken for some unusual phase of influenza. On October 9th, the chief of Medical Service, Dr. F. M. Hanes, issued an order that any case of influenza which developed any unusual symptoms, should be reported to the Neurological Service at once for examination. It became my duty, as Neurologist of the unit, to assume charge of the detection of cases of meningitis, of the isolation of suspects, the care of contacts, and treatment of all active cases.

The plan adopted for handling the situation was as follows: One ward was set aside to care for all active cases; another ward to care for convalescent cases, which required no further active treatment, and a third was used to house the contacts—patients in beds immediately at either side of patient only were considered as contacts. Contact cases were released only after three consecutive negative nose and throat cultures. Dr. John E. Wine was assigned as assistant. He cannot be given too great credit for his faithful, efficient work in caring for patients and especially for the careful records he kept which helped very materially in making this report possible.

A ward had been established immediately upon the opening of the hospital in charge of a member of the Medical Service, to which cases diagnosed as meningitis had been sent, but he had not been able to treat these cases effectively as he had practically no means of sterilizing needles, and on account of the primitive facilities could only give intraspinous treatment. Thirteen cases had been admitted on which he had made a positive diagnosis of meningitis and of these only one lived.

Upon assuming charge on October 10th, we made a complete change in the plans of treating active cases, prompted by the reports of W. W. Herrick's work on epidemic meningitis at Camp Jackson, South Carolina, which we had read and discussed at one of the conferences of medical officers of our unit, shortly before we left for France. From October 10th to October 19th we were approximating the ideals set forth by Major Herrick as rapidly as we could become familiar with the cases which had been left in the ward by our predecessor—there were no records of diagnosis, conditions on admission, treatments, etc.—and as rapidly as we could accelerate the work by securing necessary apparatus for sterilizing needles and getting a sufficient supply of syringes, rubber tubing, etc. During this time, from October 10th to October 19th, out of 23 cases received 14 died. These were treated by intraspinous serum given regularly with as frequent doses intravenously as possible but this in rather small amounts at long intervals because of lack of working utensils. However, from October 20th to November 20th, of 14 cases, 2 died, and one of these from a complicating penumococcic meningitis and one from broncho-pneumonia. There may be some who will think this low rate for the last series of cases was due to a lessening of virulence of the organism but my impression from seeing the cases, from the beginning, is that the last ones were as virulent on the average as the earlier cases. All but two of the last series were admitted between October 20th and November 4th. The rest of the paper will describe how these cases were handled and draw a few conclusions from the observations made.

Upon receiving a request for consultation, the patient was seen in his ward at once and if suspicious only, a spinal puncture was made, the fluid sent to the laboratory, the patient isolated until a positive diagnosis was made either by the laboratory or by later clinical examinations. If the fluid came back cloudy, an intraspinous treatment was given immediately and the patient transferred to the meningitis ward. If the clinical examination alone made a positive diagnosis possible, the patient was given a hypodermic of morphia at once, transferred to the meningitis ward, (usually taking from fifteen minutes to half an hour), 1 cc of serum, given subcutaneously to determine sensi-

tiveness, followed by spinal puncture immediately and giving from 30 to 60 cc of anti-meningococcic serum after draining off a little more than that amount of the cloudy fluid. A specimen of this was always sent to the laboratory for examination to confirm the diagnosis and to act as a guide for further treatment. After about an hour, from 60 to 100 cc—usually 100 cc for first injection—of serum was given intravenously in concentrated form, heated to body temperature. Of this, the first 15 cc were given at the rate of about 1 cc per minute and the rest more rapidly. Most cases took this without trouble and those who could not take it at one time, could often take the balance after waiting from several minutes to an hour. In severe cases the intravenous injection was repeated at twelve hour intervals until the symptoms were under control and an intraspinous treatment was usually given at 12 or 24 hour intervals, depending upon symptoms for five or six treatments and then at greater intervals. We kept careful records of the objective and subjective symptoms and also a three hour record of the temperature and pulse as we found that after a treatment there usually was an immediate slight increase in temperature above that existing at the time of treatment followed by a fall due to the effect of antibodies in the serum, and this succeeded by a rising temperature again, which was considered as an indication that the antibodies administered had been exhausted and there was need for a further supply. The temperature curve, together with the change in subjective and objective signs served as our guide rather than any rule of so many hours between treatments and worked out very satisfactorily. The principle we insisted upon was that the first one and usually two or three doses must be large ones of serum (60 to 100 cc) intravenously, together or alternating with intraspinous treatments of from 30 to 60 cc preceded by drainage until pressure fell to about normal. On these last 14 cases, the average number of intraspinous treatments was 6.3, with average amount of serum of 231.4 cc; of intravenous treatments 7.9, with average amount of serum of 245.9; and a total average of serum of 477.3 cc. The figures indicating size of intravenous doses are misleading as it would seem that the average intravenous dose was very small. This is incorrect, as practically every primary intravenous dose was at least 60 cc, usually 100 cc in virulent cases and this amount was usually followed a second time. The following doses, if any, were small, under the assumption that it would keep the infection under control. The probabilities are that the first one or two large doses did all the work and we might have dispensed with the other late small doses. As Herrick says: "It is a common experience to have organisms disappear from the spinal fluid after the first or second massive intravenous serum injection. The laboratory workers made special remark of this fact when such treatment began to be used freely."

In addition to the serum treatments, morphia was used freely early to relieve suffering and general nursing care combined with an abundance of nourishment and liquids. After the work in the meningitis ward had been properly established, visiting medical officers from other wards, remarked upon the freedom from suffering that existed and upon the cheerfulness of the patients and attendants. Originally the meningitis ward had been used as a place of punishment to which attendants and nurses were assigned for disciplinary reasons, but after the work began to be done properly, nurses and ward attendants tried to remain there instead of being transferred after their period of service.

We learned early in our experience that certain patients were unimproved by our usual brand of anti-meningococcic serum but would respond well upon trying serum from a different manufacturer. We also learned that after several intravenous or intraspinous treatments, that instead of being benefited by the treatment, as had been the case formerly, certain patients had developed an intolerance and would become worse following serum treatments and would complain bitterly of an aggravation of all symptoms. We were convinced of the danger of further serum treatments in cases of this type after the death with signs of acute meningitis following about twelve hours after an intraspinous treatment, in a case where all symptoms had subsided except for a slight neck rigidity and in which the spinal fluid was normal except for increased pressure. In this

instance we decided to give the treatment just to be on the safe side in avoiding a recurrence of symptoms. Post mortem showed no organisms, but extreme congestion of vessels at the base of the brain with small hemorrhages in the sheathes of some of the cranial nerves. A few days later another patient developed an extreme intolerance to intraspinous treatment even while organisms were still present in the spinal fluid. This patient recovered without any complications by depending upon regular, frequent spinal punctures with drainage of fluid until pressure dropped to about normal. He would request that a puncture be made after his headache reached a certain severity and would always be relieved by the withdrawal of fluid.

The two essentials for the successful handling of these patients, in our opinion, were large intravenous doses, combined with intraspinous treatment, and early diagnosis. For this reason, we made special efforts to detect cases in the pre-meningitis state. This usually was not possible, strictly speaking, but many of the cases were detected at the time of the first examination before the spinal fluid was cloudy and before organisms could be demonstrated until at a later puncture. These patients usually had neither neck rigidity nor positive Kernig sign. It is unfortunate that we could not attempt to secure blood cultures as Baeslack found meningococci by blood culture early in 36.3 per cent of the cases at Camp Jackson. The three things that aided in diagnosis early were, in order of importance:

(1) Change in mental state characterized by drowsiness, lethargy, desire to be undisturbed, sometimes increased irritability.

(2) Occurrence of petechial hemorrhages, occurring in crops over the trunk or most frequently the extremities.

(3) Changes in neurological reflexes.

The change in mental state was a point emphasized upon ward surgeons indicating advisability for consultation to rule out meningitis in patients convalescent from any acute illness. The petechiae and changes in reflexes were depended upon particularly in making clinical diagnosis. Dr. James M. Northington suggested a practical point that helped us in determining whether certain petechiae were naturally present or not as is illustrated in the following case:

One morning one of the contact cases, whose first nose and throat culture two or three days before had been reported negative, complained of a sudden attack of pain in left chest, about 8:00 A. M. The case showed no evidences of meningitis when seen with a member of the Medical Service who found signs of lung consolidation beginning in region of pain. There were no petechiae on careful examination at first visit but at about eleven o'clock two or three small petechiae were found about the pelvic girdle. It was uncertain whether they were fresh or had been overlooked earlier and had always been there. A ring was placed around each by means of a skin pencil and upon returning immediately after dinner several more were found. There were no other signs. Puncture was made on the strength of this alone, the fluid was under pressure, but clear, though a later puncture showed cloudy fluid containing organisms. This patient recovered rapidly from evidences of meningitis with clearing up of the fluid after treatment, but developed in convalescence an empyema in which meningococci were demonstrated in the purulent exudate. Recovery followed drainage. In addition to petechiae, fulminating cases often had large areas of purpura; in fact, sometimes almost the entire body was covered by purpuric areas as large as a man's hand. Three of these cases were admitted to the ward a few hours after onset and two of them died before any treatment could be administered. In one of these cases no evidences of meningitis could be demonstrated post mortem. Evidently these cases are those of profound general sepsis.

The neurological reflexes were of particular value in making an early clinical diagnosis. The distinguishing point was the difference in character of the reflex on the two sides. Thus the reflex on the one side might be increased,—on the other side normal, decreased or lost. Usually there was an unequal exaggeration of deep reflexes. Herrick has pointed out from a study of the deep reflexes in early stages of acute diseases at Camp Jackson that increased reflex irritability was found frequently in a variety of infections, but that this increase was uniform except in cerebrospinal meningi-

In addition to the symptoms indicated, headache was usual, undue sensitiveness to all stimuli was frequent, temperature was the rule, though usually not high and with a relatively slow pulse for the temperature change.

The complications seen are such as to seem to prove conclusively that cerebrospinal meningitis is only a local manifestation of a general septicemia. In our series, we had one patient whose initial infection apparently was a panophthalmitis which was limited to one eye, but resulted in loss of its vision; 1 case with orchitis; 2 cases with arthritis and of these one was preceded, the other followed by onset of the meningitis; 1 case with otitis media, together with multiple arthritis; 1 of pleurisy with empyema; 3 developed bronchopneumonia. In addition to these complications, 1 case responded wonderfully to serum and on the third day became suddenly worse and it was found that a pneumococcic meningitis had replaced the meningococcic. Two cases had transient cardiac dilatation with recovery. One developed measles the second day after onset of the meningitis. Two cases of measles developed meningitis.

In closing, I should like to make a comparison of the last 14 cases treated at Kerhuon as they represent the best work done in handling that local situation, with the results in series reported by Donald J. Frick and by W. W. Herrick.

Frick reported the last 20 cases of the epidemic at Camp Beauregard with 17 recoveries, mortality rate 15 per cent. Average number of intravenous doses in recovered cases, 4.3. Average amount of serum 406 cc. Intraspinous average, 19.8 doses, 492 cc serum.

W. W. Herrick reported that of 137 cases treated by older method of intraspinal therapy alone, or combined with extremely small amounts, (from 10 to 45 cc. of serum intravenously) 47 died, a mortality of 34.3 per cent, while of 128 treated by the newly developed method, 19 died, a mortality of 14.8 per cent. He tried to sterilize the blood stream early in the infection by large doses of serum intravenously. Of 13 cases treated at Kerhuon before we took charge, by intraspinous doses alone, and these given irregularly, only one lived, mortality 92.3 per cent. Of the first 23 cases treated imperfectly by us, because of inadequate equipment, 14 died, a mortality of 60.8 per cent. Of the last 14 cases treated by the intensive method given in detail earlier in the paper, only 2 died, a mortality of 14.3 per cent. Of these 1 died from a complicating pneumococcic meningitis.

CONCLUSIONS

(1) Epidemic meningitis should be considered as a possible complication in any acute infection—particularly infections of the upper respiratory tract in children and young adults.

(2) The diagnosis of the infection is desirable and is often possible in the premeningitic stage.

(3) Adequate serum treatment consists in large intravenous doses of antimeningococcic serum, combined with intraspinous treatments.

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Vol. III November, 1920 No. 11

EDITORIAL

MINNESOTA STATE MEETING IN RETROSPECT

We state but the truth when we say that the meeting of our State Association held the last of September was the most interesting and the largest (627 registered) in our history. That such a large percentage of our membership (1,548) attended the meeting certifies to the value of such meetings in that they are stimulating to all who attend but more especially to those who take part in the scientific program. Politics were conspicuous by their absence.

The local society, Ramsey County Medical Society, made use of the meeting to celebrate their fiftieth anniversary with an unusually enjoyable amusement program following the banquet.

While the sections ran their programs in a business like way, we maintain that more snap would be shown if the section chairmen would exercise their prerogatives in cutting short, not only the discussions at the end of the allotted five minutes, but also distinct wandering from the subject. An incident occurred at the International Medical Congress in London in the Summer of 1913 which made a vivid impression on the writer, when Sir William Osler, Chairman of the Medical Section, suddenly interrupted an essayist and reminded him of his subject. If this firm supervision can be administered in an international meeting, it is practical in our State meetings among ourselves. Visitors from without the State should be allowed some leeway.

The House of Delegates made an effort to simplify the administrative work of the Association by combining in a single office the functions of Secretary and Editor and the employment of an Executive Secretary at full time to handle the details of both offices. This is a step in the right direction as bookkeeping is not distinctly medical work. As some one has said, "The proof of the pudding is in the eating."

Dr. C. Eugene Riggs of St. Paul was elected President; Dr. A. N. Collins of Duluth, First Vice-President; Dr. F. P. Strathern of St. Peter, Second Vice-President and Dr. R. C. Hunt of Fairmont, Third Vice-President; Dr. F. L. Beekley of St. Paul was reelected Treasurer and the Editor was elected Secretary as stated. These officers serve the calendar year 1921 and matters should be referred to the retiring officers until January first.

EPILEPSY AND HEREDITY

The study of epilepsy and heredity by Dr. Buchanan in this issue is interesting in the showing of a 10 per cent relation to migraine and in that it brings up the age old question of heredity and disease.

Heredity is the first drawer to the right in the medical shelf into which is dumped the explanation of the causation of disease when the real etiology is obscure or unknown; the further we advance in the knowledge of disease the less heredity is invoked. Tuberculosis was most firmly intrenched as the shining example of heredity as a cause and it required forcible means to dispel the illusion. Although epilepsy is caused by so many diverse factors, such as congenital defect of the brain, tumors, irritation of the cortex by depressed bone or hemorrhage, lesions of peripheral nerves, etc., there still remains a large number of cases (60 to 75 per cent) in which no cause can be predicated, and these we call idiopathic, another synonym for ignorance. Gowers estimated heredity as a factor in about 35 per cent of cases; he as well as most writers mean by heredity the occurrence of insanity, epilepsy, migraine, hysteria

in the antecedents; when we say that epilepsy is caused by any of these diseases in our antecedents or vice versa, are we not simply running around in a circle, as these diseases so closely related may be well caused by the same or closely related factors?

Spratling found in 1,070 epileptic cases, 16 per cent of direct epileptic heredity, about 15 per cent attributed to alcoholism in the antecedents and 14 per cent to tuberculosis. Both alcoholism and tuberculosis in the antecedents occur in just about the same percentage in any 1,070 individuals and has nothing more to do with the disease than the phases of the moon.

Until the essential mechanism of the so-called nerve cell discharge is made clear we will still grope blindly for an explanation—syphilis will appear oftener and oftener in the etiological class. —H. S.

RED CROSS DUES

The entire conception of the American Red Cross Society is typical of the ideal of American democracy. Originally organized as a means of adding medical assistance to the Army and Navy in time of war, it has become a leader in the International Society in the immensely broader character of humanitarian work entered upon. Instead of returning to its prewar status, the Red Cross determined to make use of its expanded organization and increased means in meeting existing evils. These activities include the assistance of thousands of victims of fire and flood, fighting of malaria in many infected localities throughout the country, typhus in Poland, tuberculosis in Paris and feeding children in Vienna.

Particularly happy was the idea of supporting the Red Cross primarily by membership dues. Last year ten million Americans made up the membership, each contributing one dollar apiece. This year they will undoubtedly renew their membership. What more truly American! And what more appropriate time for dues to become payable than from Armistice Day to Thanksgiving!

IMPROVEMENT IN HOSPITAL SERVICE

Every state medical association in the United States has its part in the present universal movement for the betterment of hospital service. Every association now has its own committee which is studying the hospital situation in its state in cooperation with the Council on Medical Education of the American Medical Association. The council has obtained, through reports, correspondence, and other methods, data relative to all hospitals in the country and each state committee has been supplied with the data relating to the institutions in its state. Through their closer familiarity with the hospitals, or by inspections the state committee is in excellent position to verify these data and to make a reliable report to their state association and to the council.

For convenience and in order to secure uniformity of reports from the forty-eight committees regarding the relative efficiency of hospitals, blanks furnished by the council call for a rating of all hospitals in classes A, B and C, grouped also according to the special class of patients cared for. This rating is not for publication but will aid the council in the preparation of a list of hospitals which are considered worthy of approval. These lists are subject to frequent revision so that names of other hospitals can be included as soon as sufficient improvements are made to warrant their being approved. State committees are urged to promptly report to the council any instances where such improvements have been made.

The purpose of the work is to aid the hospitals in providing for their patients the best possible service and in no way to injure those which are honestly endeavoring to provide such service. Toward this end, every possible assistance will be given to individual hospitals by the council or by the local state committee in establishing such changes as will make them worthy of approval.

Forty-two state committees have reported progress in connection with the latest survey and thirty-four have turned in reports regarding hospitals inspected and graded, which have more than half the entire bed capacity of all general hospitals in the country. Meanwhile, this work of the council is not conflicting with, or duplicating the splendid work being done by the American College of Surgeons, the Catholic Hospital Association, the American Hospital Association or other agencies. In fact the work

of each agency is evidently complementing that of the others.

At the New Orleans meeting, recently the House of Delegates of the American Medical Association registered an intense interest in the improvement of hospital service and authorized the trustees to generously provide for that work. This work has been so intimately related to that of the Council on Medical Education that the name of this council was changed to the "Council on Medical Education and Hospitals."

In brief, further enlargement of hospital work by the American Medical Association is assured and in this work each state is destined to have an important part. Toward this end each association is urged to make its hospital committee permanent and to retain on it those who will not only be active but who also can do the work in the most efficient and unbiased manner. Hospitals, at present, form the closest link between the medical profession and the public and the medical profession should do all it can to aid the hospitals to provide the very best service possible.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The annual meeting of the Southwestern Minnesota Medical Society will convene at Pipestone on November 11, 1920. An exceptionally good program is in process of preparation. Dr. E. G. McKeown of Pipestone is President of the society and Dr. F. G. Watson of Worthington, Secretary-Treasurer.

ANNUAL MEETING SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Auditorium Elks' Club
November 29-30, 1920
Mankato, Minnesota

MONDAY, NOVEMBER TWENTY-NINTH

The scientific program will begin at 1:30 o'clock, P. M.

Annual banquet at 6:30 o'clock, P. M.

Evening program at 8:00 o'clock, P. M.

TUESDAY, NOVEMBER THIRTIETH

Annual business session at 7:30 o'clock, A. M.

Scientific program at 8:00 o'clock, A. M.

Luncheon tendered by physicians of Mankato, Minn., 12:00 o'clock, M.

Scientific program at 1:00 o'clock, P. M.

Adjournment at 4:30 o'clock, P. M.

Physicians from outside of the state who will appear on the program are:

Dr. Hugh Cabot, Ann Arbor, Michigan.

Dr. Emil Beck, Chicago, Illinois.

Dr. H. Winnett Orr, Lincoln, Nebraska.

Dr. Reginald Fitz, Boston, Mass., now of Rochester, Minn.

Dr. Reuben Peterson, Ann Arbor, Michigan.

Dr. Truman W. Brophy, Chicago, Illinois.

Dr. E. B. Freemann, Baltimore, Maryland.

Dr. Harry E. Mock, Chicago, Illinos.

Dr. William L. Shearer, Omaha, Nebraska.

The official program will be announced October 20, 1920.

The attendance will be large, and it is imperative that you make reservations at once, giving name and full address. Ample and comfortable accommodations will be provided if reservations are made within reasonable time, by card, telegram or telephone, addressed to the chairman Committee of Arrangements, Dr. J. Theodore Schlesselman, Mankato, Minn.

PROGRAM

Dr. R. E. Farr, Minneapolis—Local Anesthesia and Surgical Technic (L).

Discussion—Dr. S. C. Schmitt, Minneapolis; Dr. Matt Cremer, Red Wing.

Dr. W. L. Benedict, Rochester—Treatment of Trachoma.

Discussion—Dr. Carl L. Larson, St. Paul; Dr. James S. Reynolds, Minneapolis.

Dr. Walter R. Ramsey, St. Paul—Recent Progress in the Diagnosis and Treatment of Congenttal Syphilis in Infants and Children.

Discussion—Dr. Frederick C. Rodda, Minneapolis; Dr. R. N. Andrews, Mankato; Dr. O. W. Roe, Duluth; Dr. Lyda Osburn, Mankato.

Dr. J. F. Corbett, Minneapolis—The Surgical Treatment of Spinal Cord Injuries.

Discussion—Dr. A. S. Hamilton, Minneapolis; Dr. A. W. Adson, Rochester.

Dr. W. A. Jones, Minneapolis—Atypical and Unusual Forms of Paralysis.

Discussion—Dr. Haldor Sneve, St. Paul; Dr. E. M. Hammes, St. Paul.

Dr. Wm. Carpenter MacCarty, Rochester;—The Relation of Chronic Hepatitis to Cholecystitis.

Discussion—Dr. Kano Ikada, Minneapolis; Dr. H. E. Robertson, Minneapolis.

Dr. Hugh Cabot, Professor or Surgery, University of Michigan, Ann Arbor, Mich.—Some Unsettled Problems in the Management of Renal Tuberculosis.

Discussion—Dr. Wm. F. Braasch, Rochester; Dr. Oscar Owre, Minneapolis; Dr. E. S. Judd, Rochester.

Dr. Emil G. Beck, Chicago, Ill.—Intentional Removal of Skin and Other Tissues Over-lying Deep Seated Inoperable Carcinoma for Effective Radium Treatment (L).

Discussion—Dr. Wm. Mayo, Rochester; Dr. A. S. Fleming, Minneapolis; Dr. Archibald MacLaren, St. Paul.

Dr. Reuben Peterson, Professor of Surgery, University of Michigan, Ann Arbor, Mich.—Experiences With Intraperitoneal Gas Injection and the X-Ray As An Aid to Gynec Ological Diagnosis.

Discussion—Dr. Albert F. Tyler, Omaha, Neb.; Dr. J. C. Litzenberg, Minneapolis; Dr. R. D. Carmen, Rochester.

Dr. E. B. Freeman, Professor of Medicine, Johns Hopkins University, Baltimore, Md.—Subject: "Spasmodic Stenosis of the Esophagus."

Discussion — Dr. Reginald Fitz, Rochester; Dr. Robert Rizer, Minneapolis; Dr. Frank Smithies, Chicago, Ill.

Dr. Harry Mock, Chicago, Ill.—A Few Examples of Reconstructive Surgery With After-Care.

Discussion—Dr. John Rischmiller, Minneapolis; Dr. Warren A. Dennis, St. Paul; Dr. Arthur A. Law, Minneapolis.

Dr. Henry W. Woltman, Rochester—Spina Bifida.

Discussion—Dr. E. M. Hammes, St. Paul; Dr. Arthur Strachauer, Minneapolis.

Dr. H. Winnett Orr, Lincoln, Neb.—Splints As a Factor in the Cure of Patients After Injuries to or Operations Upon the Spine.

Discussion—Dr. M. S. Henderson, Rochester; Dr. A. E. Wilcox, Minneapolis.

Dr. Truman W. Brophy, Chicago, Ill.; Dr. Wm. L. Shearer, Omaha, Neb.—Cleft Palate and Harelip Procedures, Illustrated.

Discussion—Dr. Gordon B. New, Rochester; Dr. Harry P. Ritchie, St. Paul.

Dr. Reginald Fitz, Rochester — The Phenolsulphonephthalein Test and the Nonprotein Nitrogen of the Blood in Chronic Nephritis.

Discussion—Dr. Hugh Cabot, Ann Arbor, Mich.; Dr. E. L. Tuohy, Duluth; Dr. L. G. Rowntree, Rochester.

Dr. Chas. H. Mayo, Rochester—Tuberculous Peritonitis.

Discussion—Dr. A. E. Spalding, Luverne; Dr. Hugh Cabot, Ann Arbor, Mich.; Dr. Ruben Peterson, Ann Arbor, Mich.

Dr. J. P. Schneider, Minneapolis—The Effect of Quinine Sulphate on the Liver.

Discussion—Dr. Arthur D. Hirschfelder, Minneapolis; Dr. H. Z. Giffin, Rochester.

Dr. John C. Staley, St. Paul—Subject: "Sacro-Coccygeal Dermoids."

Discussion—Dr. Fred Rankin, Rochester; Dr. E. M. Jones, St. Paul.

Dr. Wm. J. Mayo, Rochester—Hemolytic Ictherus.

Discussion—Dr. E. B. Freeman, Baltimore, Md.; Dr. Emil Beck, Chicago, Ill.; Dr. Frank Smithies, Chicago, Ill.

Dr. H. W. Meyerding, Rochester—Subject: "Delayed-Union and Non-Union in the Radius and Ulna."

Discussion—Dr. H. W. Orr, Lincoln, Neb.; Dr. Arthur D. Gillette, St. Paul.

Dr. H. C. Giffin, Rochester, President's Address—The Present Status of Splenectomy as a Therapeutic Measure.

Dr. Verne C. Hunt, Rochester—"Complications Attending Prostatectomy."

Discussion—Dr. Franklin Wright, Minneapolis; Dr. G. J. Thomas, Minneapolis.

Dr. Henry S. Plummer, Rochester—Subject: "The Relationships of Essential Hypertension and Hyperthyroidism."

Discussion—Dr. C. H. Mayo, Rochester; Dr. E. B. Freeman, Baltimore, Md.

Dr. Arthur D. Hirschfelder, Minneapolis—Subject: "Saligenin, A New Non-Toxic Local Anesthetic, and Its Mercury Derivative, A New Antiseptic."

Discussion—Mr. D. Siperstein, Minneapolis; Mr. M. Litmann, Minneapolis.

Dr. Frank Smithies, Chicago, Ill.—Subject: "Non-Surgical Drainage of the Billiary Tract: Its Diagnostic and Therapeutic Possibilities."

Discussion—Dr. W. J. Mayo, Rochester; Dr. Emil Beck, Chicago, Ill.

Dr. Chas. Lyman Greene, St. Paul—Subject: "Pitfalls in the Treatment of Heart Disease."

Discussion—Dr. F. S. Bissell, Minneapolis; Dr. E. T. F. Richards, St. Paul.

NEW AND NON-OFFICIAL REMEDIES

During September the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Non-official Remedies.

United Synthetic Chemical Corporation:

20 per cent Aromatized Suspension made from Benzyl Benzoate (Van Dyk & Co.)

The Heyden Chemical Works:

Proganol.

OFFICIAL ARTICLES NOT WITHIN THE SCOPE OF NEW AND NON-OFFICIAL REMEDIES:

Capsules Folia-Digitalis (Upsher Smith).

Tincture of Digitalis (Upsher Smith).—These products are sold by Upsher Smith, St. Paul, Minn. The Council finds that they have the status of official articles and are, therefore, not within the scope of New and Non-official Remedies.

NEW AND NON-OFFICIAL REMEDIES

Sodium Arsphenamine. — Sodium Arsenphenolamine.—The sodium salt of 3-diamino-4-dihydroxy-1-arsenobenzene with a stabilizing medium. The arsenic content of three parts of sodium arsphenamine is equivalent to two parts of arsphenamine. Sodium arsphenamine has the same actions and uses as those of arsphenamine; its advantage over arsphenamine is that it does not require addition of alkali before use. To prepare the solution the sodium arsphenamine is added to the required amount of sterile water and dissolved by gentle agitation.

Sodium Diarsenol.—A brand of sodium arsphenamine. Sodium diarsenol is marketed in ampules con-

taining 0.15 Gm., 0.3 Gm., 0.45 Gm., 0.6 Gm., 0.75 Gm., and 0.9 Gm., respectively. Diarsenol Laboratories, Inc., Buffalo, N. Y.

Corpus Luteum Tablets—Armour 5 grain.—Each tablet contains 5 grains of desiccated corpus luteum—Armour (See New and Non-official Remedies, 1920, p. 203), (Jour. A. M. A., Sept. 18, 1920, p. 815).

PROPAGANDA FOR REFORM

The following products have been the subject of prosecution under the Federal Food and Drugs Act: Beecham's Pills were held misbranded because the curative claims made for them were false and fraudulent, and because the pills were not made in England as claimed. Pike's Liver, Kidney and Stomach Remedy, because the therapeutic claims were false and fraudulent. Ergot Apiol Compound (Evans Drug Co.), because the capsules did not contain the claimed amounts of drug and because they were an imitation. Prescription 1000, sold in two forms, a copaiba preparation for internal use and a dilute potassium permanganate solution for external use, was sold under false and fraudulent therapeutic claims. Rival Herb Tablets were tablets falsely claimed to be chocolate coated and sold under false and fraudulent therapeutic claims. Wilson's Solution Anti-Flu consisted essentially of oil of eucalyptus, methyl salicylate and thymol or oil of thyme, and was falsely claimed to be effective as a remedy for influenza, colds and grippe. Castor Oil Capsules (Evans Drug Co.), did not contain the amount of drug claimed (Jour. A. M. A., Sept. 4, 1920, p. 690).

Prevention of Goiter.—The latest report on the prevention of goiter by administration of sodium iodid by Marine and Kimball—an investigation carried out under a grant from the Therapeutic Research Committee of the Council on Pharmacy and Chemistry—indicates a striking difference between those girls not taking and those taking iodin. The difference is manifested both in the prevention of enlargement and in a decrease in the size of existing enlargements. Of 2,190 pupils taking 2 gm. of sodium iodid twice yearly, five have shown enlargement of the thyroid, while of 2,305 pupils not taking the prophylactic, 495 have shown enlargement of the thyroid. Of 1,182 pupils with thyroid enlargement at the first examination who took the prophylactic, 773 thyroids decreased in size, while of 1,048 pupils with thyroid enlargement at the first examination who did not take the prophylactic, 145 thyroids decreased in size (Jour. A. M. A., Sept. 4, 1920, p. 674).

Lyko.—This is an alcoholic tonic which has been widely advertised in the newspapers. It is put out by the Lyko Medicine Co., Kansas City, Mo. Lyko is claimed to stimulate the appetite, tone up the digestive organs and to have laxative qualities. It is said to contain caffein, kola, phenolphthalein and cascara sagrada. The advertising does not discuss the most powerful ingredient, alcohol, although the label declares the presence of 23 per cent of this drug. As a result of an exhaustive examination, the A. M. A. Laboratory concludes that Lyko is essentially a sweetened solution containing about 22.2 per cent of alcohol together with insignificant amounts of caffein, cascara extractives and phenolphthalein. There was no evidence to show that the product is sufficiently medicated to prevent its being used as a beverage (Jour. A. M. A., Sept. 11, 1920, p. 757).

Nature's Creation.—This is one of the fake consumption cures. It was originally put on the market as an absolute cure for syphilis. When analyzed in the A. M. A. Laboratory it was found to be essentially a solution of potassium iodid in a weakly alcoholic medium containing vegetable extractives and flavoring matter, and small quantities of inorganic salts (Jour. A. M. A., Sept. 11, 1920, p. 758).

Iodex, A Misbranded Iodin Ointment.—(1) Claim: 5 per cent iodin. Finding: iodin content only about 3 per cent. (2) Claim: free iodin. Finding: no free iodin. (3) Claim: absorbed through the skin, iodin can be found in urine 30 minutes after inunction. Finding: the assertion that iodin can be found in the urine after Iodex has been rubbed on the skin has been experimentally disproved. The preceding is taken from a poster of the A. M. A. Chemical Laboratory at the A. M. A. New Orleans meeting (Jour. A. M. A., Sept. 18, 1920, p. 830).

Diabetic Foods.—A report from the Connecticut Agricultural Experiment Station on diabetic foods includes not only the content of carbohydrate in these products but also that of protein and fat in view of the recognized necessity of taking into account all of the nutrients in any proper formulation of regimen for the diabetic patient. There is no satisfactory definition of what a diabetic food is, nor is there any universal diabetic food. The value of accurate information regarding the makeup of such products as may find special application in the dietotherapy, such as given in the Connecticut report, lies in the fact that it enables clinicians and the patient to proceed intelligently in the direction of diet planning with a view to tolerance of all the nutrients. Of particular interest in the report are the analyses of bran, which is being widely used at present to give bulk to the food residues in the alimentary canal. It appears that common, unwashed bran frequently contains no more than half as much starch as some of the advertised brands of "health" bran (Jour. A. M. A., Sept. 18, 1920, p. 818).

Calcidin Tablets—Abbott.—Calcidin is claimed to be a mixture of iodin, lime and starch. In contact with water, the iodin and lime react to form calcium iodid and calcium iodate. By the acid of the gastric juice, the calcium iodid and calcium iodate are decomposed with liberation of free iodin. The administration of calcidin tablets amounts to giving free (elementary) iodin. The effects produced by the administration of free iodin appear not to differ from those produced by the administration of iodids, and, therefore, calcidin has no advantage over the iodids,

such as sodium iodid (Jour. A. M. A., Sept. 25, 1920, p. 892).

Some Misbranded Venereal Nostrums. — The following preparations have been the subject of prosecution by the federal authorities under the Food and Drugs Act on the ground that the therapeutic claims which were made for them were false and fraudulent: Injection Cadet (E. Fougera & Co., New York), a dilute watery solution of copper sulphate and unidentified plant material. Knoxit Injection (Beggs Manufacturing Co., Chicago), a solution of zinc acetate with alkaloids of hydrastis, in glycerin and water. Knoxit Liquid, a solution of zinc acetate with alkaloids of hydrastis, in glycerin and water. Knoxit Globules, essentially a mixture of volatile and fixed oils and oleoresins, including copaiba balsam, cinnamon and cassia. Grimault's Injection (E. Fougera & Co., New York), a weak watery solution of copper sulphate and plant extractives, probably matico. Halz Injection (Edw. Price Chemical Co., Kansas City, Mo.), consisting essentially of zinc sulphate, boric acid, glycerin, traces of alum and formaldehyd and water. Tablets which seem to go with the product consisted essentially of calcium and magnesium carbonates, copaiba, a laxative plant drug, plant extractives, a small amount of an unidentified alkaloid, sugar and starch. Noxit (Frederick F. Ingram Co., Detroit), consisting essentially of opium, berberine, a zinc salt, glycerin, alcohol and water. Crossmann Mixture (Wright's Indian Vegetable Pill Co., New York City), essentially an alcoholic solution of volatile oils, including balsam copaiba and cubebs. Santal-Pearls (S. Pfeiffer Mfg. Co., St. Louis, Mo.), consisting essentially of a cinnamon-flavored mixture of santal oil and copaiba. Cu-Co.Ba-Tarrant (Tarrant Co., New York City), consisting essentially of a mixture of extract of cubebs and copaiba with magnesium oxid. Hygienic and Preservative Brou's Injection (E. Fougera & Co.), consisting essentially of acetates and sulphates of zinc and lead, morphin, water and a very small amount of alcohol (Jour. A. M. A., Sept. 25, 1920, p. 891).

OBITUARY

DR. ARTHUR G. KESSLER

Dr. Arthur G. Kessler, physician in charge of the Sunnyrest Sanitarium, Crookston, died suddendly at the Sanitarium, Sept. 10, 1920. He was born in Bryant, Indiana, in 1876 and came to Crookston in April 1919. He had been in the army service having the rank of captain. Previous to entering the service, he was in charge of the Ottertail Sanitarium at Battle Lake. He has been practicing medicine for fifteen years, seven years of which he has specialized in tuberculosis. He is survived by a widow, mother, three brothers and one sister.

DR. T. A. CONLEY

Dr. T. A. Conley of Cannon Falls died at the age of 72 years at his home on September 12, 1920. Dr. Conley suffered from a stroke of apoplexy four years ago. Dr. Conley was born in New York and has practiced medicine for 44 years. He was well known in medical circles and was a former president of the Goodhue County Medical Society. Two sons survive him.

DR. HARRY R. NORDLEY

Dr. Harry R. Nordley, for six years a practicing physician in Minneapolis, and assistant to the city chemist, died at the summer home of his parents, Mr. and Mrs. Nordley, at West Arm, Lake Minnetonka. He died of miliary tuberculosis.

Dr. Nordley was born in Minneapolis Nov. 8, 1887. He was graduated from South high school in 1906, and from the medical department of the University of Minnesota in 1912. He practiced at Blackduck, Minn. for two years and then came to Minneapolis.

He enlisted in 1917. He was a member of Navy Base Hospital No. 13, stationed at Minneapolis. He was a member of the Hennepin County Medical association.

Funeral services were held from the home of his parents, 2013 Fourth St., So. Interment was at Lakewood. Active pallbearers were Mr. Hendricks, Dr. Thorwald Peterson, Dr. Josewitz, Dr. Undine and Mr. Hugo Peterson. Besides his parents, two brothers George and Arthur survive.

CORRESPONDENCE

Vienna, August 28th, 1920.

American Relief Committee for Sufferers in Austria:

I acknowledge herewith receipt of Draft No. 41571 for 4,779.40 kronen according to your wishes and add my heartfelt thanks to you as well as especially to Dr. J. W. Jobling and his charitable cooperators, to all of whom I would write if I knew their respective addresses. Tell them, please, how much we appreciate their welcome endeavors to assist us in our plight, which seems to become more and more distressing. We must repeat it again and again, that the crippled state new Austria can't live by itself alone, having been deprived of all its former resources—not being able to produce more than the fourth part of food, wanted by its six millions of inhabitants and having neither coal nor the necessary raw materials to work into industrial articles, to buy food with, the crowns having become nearly worthless.

If this hopeless condition of new Austria is not grasped to its full extent by the outer world very soon, the twentieth century of progress and civilization will witness the spectacle, unheard of in the history of mankind, of a people doomed to die of hunger, although it is intelligent, skillful and willing to work.

With repeated warm thanks to the donors and to you, I remain,

Gratefully yours,
Prof. ADOLF LORENZ.

OF GENERAL INTEREST

Dr. P. H. Gibson of Crookston has moved to Des Moines, Ia.

Dr. Peter H. Cremer has been appointed health officer of Hastings.

Dr. William M. Empie was re-engaged as school physician of Virginia.

Dr. Bernice Jameson of Rochester was married on September 1st to Clement J. Todd of Corona, Cal.

Dr. Archa E. Wilcox of Minneapolis announces that he has limited his practice to Orthopedic, Industrial and Fracture Surgery.

Drs. O'Brien, Teisberg and Williams announce the removal of their offices and X-Ray Laboratory from the Lowry Building to Rooms 624 to 627 Hamm Building, St. Paul.

Dr. Charles N. Hensel announces that he has severed his present associations and will continue in the practice of internal medicine at 1144 Lowry Building, St. Paul.

At the annual meeting of the Minnesota Medical Alumni Association held at the Minnesota Club, St. Paul, October 1, 1920, Dr. Robert Earl of St. Paul was elected President and Dr. Donald Daniel of Minneapolis, Secretary and Treasurer.

Dr. A. Wohlrabe, formerly with the Mankato Clinic, has associated himself with Drs. Willson and Cabot at 323 La Salle Bldg., Minneapolis. He will limit his practice to Internal Medicine.

After fifteen months service as commander of the Red Cross in Poland, Dr. Albert J. Chesley, Minneapolis physician and former director of preventable diseases of the State Board of Health, has returned.

Dr. Frederick L. Hoffman, of the Prudential Insurance Company, spoke recently before the meeting of the general staff and the visitors of the Mayo Clinic. His subject was "The practical value and limitations of medical statistics."

A local chapter of the medical fraternity Phi Chi, to be known as Kappi Chi has been established at the University. Dr. T. B. Pearson, grand secretary of the fraternity officiated at the ceremonies. Vincent Napoloello, a medical student was elected secretary of the local chapter.

The new hospital erected for the Aberdeen Clinic at Aberdeen, S. D., was formerly opened with appropriate ceremony on September 27th, 1920. Dr. Edward Rosenow of Rochester, gave an illustrated lecture on Infantile Paralysis in connection with the celebration of the occasion.

The Ramsey County Medical Society has appointed a Committee on Vienna Relief whose function is to receive contributions for Vienna physicians. The fund raised will be sent to the American Committee for Vienna Relief, 1001 Peoples Gas Building, Chicago, for aid of physicians only.

The American College of Surgeons is planning to hold district or state gatherings to bring its members together for clinics in such sections. An executive committee to plan for these meetings in Minnesota was appointed as follows: Dr. Thomas McDavitt, St. Paul, Dr. A. T. Mann, Minneapolis, and Dr. C. H. Mayo, Rochester.

The League of Red Cross Societies, Geneva, Switzerland, published the first issue of the International Journal of Public Health in July, 1920. This is a new magazine devoted to international health and the first issue includes an article by Tropeano on Social Medicine and one by Clarke on Venereal Disease after the War.

A medical chautauqua for physicians of Dayton, Ohio, and vicinity will be held at the Fidelity Building, Dayton, September 21 to 24. Among the physicians on the program are Dr. Hugh T. Patrick, Dr. Dean Lewis, and Dr. A. C. Croftan, Chicago, Dr. W. B. Cannon, of Harvard University, and Dr. H. I. Lillie, of Rochester, Minnesota.

A good office location in what is probably the most thickly populated residence district in St. Paul is available for the right physician. The office suite has been used for a number of years by a physician

and dentist but during the war was vacated by the physician. Communicate with Dr. H. C. Frayer, The Angus, 394 Selby Ave., St. Paul, Minn.

The State Board of Health calls attention to the fact that physicians are responsible for the information contained in birth certificates. The penalty for furnishing false information effecting any certificate or record is a fine of $100.00 or imprisonment for not more than ninety days. Recent legislation regarding passports, schooling and occupation has rendered vital statistics more important.

The Academy of Clinical Medicine of Duluth, Minnesota, has been organized and is occupying its new building opposite St. Lukes Hospital. The directors consist of Drs. Benjamin F. Davis, Surgery; Lloyd L. Merriman, Medicine; Frederick Myles Turnbull, Eye, Ear, Nose and Throat; Veader N. Leonard, Gynecology; Charles H. Schroder, Pediatrics; Arthur H. Schwartz, Dermatology; F. H. Saniter, Oculist; Arthur J. Huderle, Dental Surgery; F. C. McLean, Reontgenology; C. McCabe, Laboratory and F. W. Sinclair, Administration.

Prof. U. Crapi of Lugano, Switzerland, the General Secretary of the International Association of "Pneumothorax Artificialis", in a circular letter forwarded by Dr. S. Adolphus Knopf of New York, has issued an appeal to all former members of the association and all other physicians interested in artificial pneumothorax to send their names and addresses and subscription of five francs to him. Subscribers will receive the journal known as Pneumothorax Therapeutique as soon as publication is renewed, and a list of the names of physicians throughout the world who practice this therapeutic procedure.

All-American Health Conference—The first of a series of regional health conferences authorized by the International Health Conference in Cannes is to be held in Washington, December 6-13. It will be devoted to a consideration of Venereal diseases. The conference is being organized under the joint auspices of the U. S. Interdepartmental Social Hygiene Board, the U. S. Public Health Service, the American Red Cross and the American Social Hygiene Association. Prof. William H. Welch of Johns Hopkins has consented to serve as president, and already assurances have been received that some of the foremost physicians and sociologists will participate.

The owner of a pair of gloves found at the recent State Medical meeting may receive same by furnishing description to the editor.

OPPORTUNITIES FOR PRACTITIONERS

1. Licensed practitioners may be registered as special students for regular class work, lectures, dispensary and clinics on payment of $30.00 per quarter of 12 weeks. They are privileged to attend as visitors at any time without fee. Copies of the bulletin of the Medical School, containing description of all required and elective courses, will be sent on request.

2. The laboratories of the Medical School are available for purposes of special study or research at almost any time. These laboratories include Anatomy, Physiology, Physiological Chemistry, Bacteriology, Pharmacology, Pathology, Experimental Medicine and Experimental Surgery. Usually reasonable assistance can be offered and instructors are at hand, although the present staff is not sufficient to permit of assignment of instructors exclusively to this work.

A cost charge for animals and expensive materials will be made, and the registration fee is $30.00 a quarter.

Practitioners desiring to dissect or work in Cadaver Surgery should write in advance, as the present shortage of cadavers is complicating all work of this kind.

3. The School will resume at an early date the "Physicians' Days" of special clinics, discontinued on account of the war, and, last fall, on account of the influenza epidemic. Announcements will be published and a good attendance is hoped for.

4. Physicians are invited to attend "rounds" and clinics at the University and allied hospitals at any time.

5. Thorough advanced courses for the training of specialists are offered by the Graduate School in connection with the Medical School at Minneapolis and the Mayo Foundation at Rochester. Special bulletins concerning this work will be sent on request addressed to the Dean of the Graduate School.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH.

THOMAS A. PEPPARD
LA SALLE BLDG., MINNEAPOLIS

ARTERIO SCLEROSIS, CONTRACTED KIDNEY, AND BLOOD PRESSURE: Harpuder (Deutsch Arch. f. Klin. Med., 1919, 129, 74) records a careful study of 1,165 cases of arterio sclerosis at the medical clinic in Munich. The vast majority of these patients are over 40 years of age. Under 60 there are two males to one female. Over 70 the majority are females. The causes of death in these cases were as follows: 53% died from circulatory failure, 38% from cerebral causes, and 7% from uremia.

The most frequent finding is a peripheral Sclerosis which may vary very greatly in degree. Changes in the aorta called for a differential diagnosis of

angina pectoris, luetic aortitis, and aortic sclerosis. Pain and abnormal systolic sounds at the aortic area indicate more frequently luetic disease. As a general rule, aortic changes occurring in a luetic may be considered as due to lues. Angina Pectoris is less frequent. The most frequent evidences of the sclerotic process involving the heart and aorta are: first, enlargement of the heart, and second, an accentuated second aortic tone. Evidences of cerebral arterio sclerosis were headache, insomnia, pains in extremities, fatigue, vertigo, and physic changes. In these cases the patient presents himself earlier and as a rule dies from his cerebral condition before a cardiac insufficiency develops.

In the entire series the kidney is attacked the most frequently of all organs, the process going on in the smaller kidney vessels being of most importance. Evidences of kidney change were; albuminuria, occurring in 53%, often in minute quantities; the presence of casts noted in 18%, this being a little more reliable finding indicative of actual kidney change. Kidney function was best determined by tests of concentration and by Hedinger and Schlayer tests. In a considerable proportion (41%) there was present cardiac hypertrophy before any signs of renal insufficiency. Hypertension, whether due to vascular change in kidney, in the general perpheral circulation, or whether a separate entity is still a question. Arterio Sclerosis is in itself (even in the heart and brain vessels) not a cause of hypertonia. In arterio sclerotic contracted kidney the blood pressure is raised constantly and considerably. In nearly all cases of lasting hypertension the kidney is clinically demonstrably injured. In a small number of cases (2.8%) with a lasting hypertonia there could not be proven any disturbance of urine secretion. The extent of the microscopic changes in the kidney need not parallel the rise of blood pressure. Hypertonia is shown not to be a necessary accompaniment of old age.

T. A. Peppard.

THE BLOOD SUGAR TOLERANCE TEST AS AN AID IN THE DIAGNOSIS OF GASTROINTESTINAL CANCER: Julius Friedenwald & George H. Grove (Am. Jour. Med. Sc., Sept., 1920). Freund, in 1885, was the first to point out that there is always a hyperglycemia in carcinoma, based on his observation of 70 blood sugar investigations. This was not true in sarcomatous patients. Trinkler investigated the blood sugar content in patients afflicted with various conditions, and found the hyperglycemia to be constant in cancer but not in such conditions as acute infections, heart disease, nephritis, syphilis, etc. He concluded from his findings that hyperglycemia is always present in cancer patients and to a greater extent in those who had cancer of the internal organs than in those who had cancer of the skin or mucous membrane. Hamman and Hirschman observed that in normal individuals, after the ingestion of 100 grms. of glucose, the blood sugar rises to a maximum concentration, reaching its height in 30 minutes, followed by gradual fall. Some rather typical curves following the ingestion of 100 grms. of glucose were also observed in diabetes, nephritis, thyroid disease and pituitary disease. Rohdenburg, Bernhard and Krehbiel, standardized the determinations by making the blood sugar estimate immediately before the injection of the glucose, 45 minutes after, and 120 minutes after. In the normal individual the blood sugar reached its maximum in 45 minutes, and gradually receded to the normal. In cancer, on the other hand, they observed that the blood sugar rose steadily up to 45 minutes after the ingestion, and continued to rise or remained stationary for 120 minutes after the ingestion of the glucose, being either as high or higher at the 45 minute reading. After 120 minutes the curve gradually began to recede, reaching the normal again in 3 to 4 hours. This they found not to be present in other diseases. Benedict and Lewis, noted a steady increase in the blood sugar content as the malignancy progresses, reaching a maximum just prior to death, the hyperglycemia being in all probability the result of the constant demand of the growing tumor for carbohydrates. Rohdenburg, Bernhard and Krehbiel have divided these curves into three types. Firstly, those in which the figure at 120 minutes is as high or higher than at the 45 minute interval; secondly, those in which the curve at 120 minutes is almost or nearly to the original figure before the ingestion of glucose; thirdly, those in which the initial sugar concentration was higher than at 45 minutes and the 120 minute interval showed a return to the original figure more or less complete. They concluded that although the reaction was not specific, yet they found most cases of malignancy to conform to the type 1 reaction.

Friedenwald and Grove have placed their reactions into four groups, the 4th, or so-called "cancer curve" being particularly interesting. In 32 cases of cancer of the gastrointestinal tract they found the initial content in the blood to be from .14 to .17 per cent, rising to .21 to .24 after 45 minutes, and remaining at that level for 120 minutes, at no time during the period falling below .20 per cent. This was not present in any of the other 55 examinations done on cases of carcinoma outside of the gastrointestinal tract, sarcoma, or in the benign affections of this tract.

Dr. Charles E. Simon has suggested two possibilities as the reason for this hyperglycemia and this typical curve. His first hypothesis is that as dextrose is the most potent source of energy in cell production, it is conceivable that the liver is called upon for an increased supply of dextrose. This call is responded to, but the deficient blood supply in carcinoma makes it possible for only a small portion of the sugar being utilized, the hyperglycemia therefore resulting. In sarcoma we have a more abundant blood supply, in the affected tissues and the hyper-

glycemia is not evident, the available dextrose being utilized by the neoplasm. The second hypothesis is that a hormone is liberated by the carcinoma, in consequence of which the normal power of oxidation of sugar by the tissues is impaired, the hyperglycemia again resulting in consequence.

The writers believe that the test is of considerable importance in the diagnosis of cancer, although its availability in early cases has not been established on account of lack of opportunity to make a sufficient number of tests on cases of this kind.

F. J. Hirschboeck.

A STUDY OF HYPERACIDITY: Martin E. Rehfuss and Philip Hawk (Amer. Jour. of Med. Sc., Sept., 1920). Hyperacidity has been accepted as a clinical entity without careful study of normal secretion, with which to compare pathological cases. Due to the large number of pathological cases studied, an opinion has been established that high acid titration figures indicate gastric pathology.

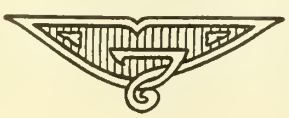
The subjective symptom, hyperacidity, which is really the result of lowered acid tolerance, must not be confused with titratable hyperacidity for it has been repeatedly seen in cases of gastric achilia and many cases of high titration values are seen in which it is not present.

Eight hundred and forty-two cases were studied to determine the response to all types of food. It appears that every normal individual has a characteristic form of gastric digestion and can be placed in one of three classes, both as to secretion and motor activity. These three classes have been termed hyper, iso and hypo and occur in approximate proportions of 40%, 30%, and 30% respectively.

So wide is the range of secretory and motor response in normal cases that it is difficult to determine when the limit of the normal and the beginning of the pathological are reached. For instance, fasting hypersecretion (Reichmann's Disease) and digestive hypersecretion are but exaggerations of the hypersecretory type. Such findings in an individual of the iso or hypo secretory type would be distinctly abnormal.

The old standard of acidity, eighty degrees, which was supposed to indicate hyperacidity, can no longer be considered as correct, for in forty per cent of the normals this figure was exceeded. An acidity of one hundred degrees or over is frequently encountered. Hyperacidity, as expressed by an actual increase in titratable acidity over the normal range, scarcely exists.

Robert H. Kennicott.



SURGERY

SUPERVISORS:
E. MENDELSSOHN JONES
LOWRY BLDG., ST. PAUL.
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER.

RESULTS OF OPERATION FOR ADENOMA WITH HYPERTHYROIDISM AND FOR EXOPHTHALMIC GOITER: Edward Starr Judd, (Ann. of Surg., vol. 72, Number 2, p.p. 145-151). In cases of adenoma with hyperthyroidism the enlargement of the thyroid has existed for a long time, in our experience almost twenty years on an average, before it was associated with symptoms of hyperthyroidism. In the cases of exophthalmic goiter this interval was usually less than one year. Acute crises of hyperthyroidism are not so apt to occur in cases of toxic adenoma as in cases of exophthalmic goiter; the toxic features develop more slowly and are progressively noticeable. The basal metabolic rate is always increased, but does not average so high as in exophthalmic goiter.

This study of the results of operation for adenoma with hyperthyroidism and for exophthalmic goiter is based upon two selected groups of 100 cases each, 100 consecutive cases of adenoma with hyperthyroidism in which operation was done in 1917 and 1918, and 100 consecutive cases selected from the cases of exophthalmic goiter in which operation was done in 1914. Letters of inquiry were sent to the patients in each group. Information was received concerning all the patients with adenoma with hyperthyroidism and concerning ninety of the patients with exophthalmic goiter. Eighty-eight of the patients with adenoma were females whose average age was 48.8 years; the average age of the twelve males was 48.4 years. Eighty-three of the patients with exophthalmic goiter were females, their ages averaging 34.3 years; the age of the seventeen males averaged 36.6 years. In adenoma with hyperthyroidism, the goiter was first noticed at an average age of 29.8 years, and the patient came for treatment nineteen years and four months later, after having had symptoms for two years and five months. In the cases of exophthalmic goiter the enlargement was noticed at an average age of 31.8 years, and the patients came for treatment three years and eight months later, after having had symptoms for one year and nine months.

In the cases of adenoma with hyperthyroidism, the average pre-operative metabolic reading in ninety-eight cases was 32.7, and the average postoperative reading in forty-four at an average of twenty-two days after operation was 9.2. In the cases of exophthalmic goiter consistent metabolic readings were not taker in 1914.

In the group of cases of adenoma with hyperthyroidism, thyroidectomy was done with small risk, while in the 100 cases of exophthalmic goiter, primary

thyroidectomy was done in but thirty-six, and preliminary primary or secondary ligation in sixty-four. In most cases the best operative results are obtained by removal of all except the posterior part of each lobe.

Results of Operation in 100 Cases of Adenoma With Hyperthyroidism:

Patients cured	83	83%
Patients markedly improved	5	5%
Patients slightly improved	1	1%
Patients not benefited	2	2%
Patients died from all causes during the two years	9	9%

Results Six Years After Operation in 88 Cases of Exophthalmic goiter:

Patients cured	58	64.44%
Patients markedly improved	12	13.33%
Patients slightly improved	5	5.55%
Patients died from all causes during the six years	15	16.66%

V. C. HUNT.

OBSERVATION ON THE TREATMENT OF CHRONIC EMPYEMA: George J. Heuer, (Ann. of Surg., July, 1920, No. 1). It is possible to sterilize chronic empyemic cavities by the prolonged use of antiseptic solutions. Sterile intrapleural cavities need not be obliterated; they are quite compatible with good health. The author's experience shows that he, at least, has been unable to sterilize all empyemic cavities within a reasonsable length of time by injecting them with bismuth paste. In the smaller cavities, especially in the long, tubular intrapleural sinus tracts of tuberculous origin, the injection of bismuth paste has proved quite uniformly successful.

The author observes that the thickened pleura about an empyemic cavity probably prevents the obliteration of the cavity. By stripping the parietal pleura from the thoracic wall well beyond the limits of the cavity and excising it, the cavity might be obliterated more readily, resulting in an extrapleural cavity, upon the mesial wall of which is an area of visceral pleura. The procedure removes at least half of the infected pleura and allows the formation of granulation tissue from the thoracic wall. Dakinization of the extrapleural cavity is necessary because of the presence of infection. Four patients have been successfully treated by this method. Sterilization of the cavities and closure of the sinus tracts were effected in one case in thirteen days, in one case in twenty-one days, in one case in forty days, and in one case in sixty-seven days. The patients have remained well for from six months to one and one-half years.

In the cases in which bismuth x-rays show a sinus leading directly into a single cavity, the tubes of the irrigating apparatus are introduced into the cavity without preliminary operative procedures and the sterilization of the caviety attempted.

In cases in which the mechanical conditions for subsequent sterilization are unsatisfactory, a preliminary operation, with excision of the sinus tract or the establishment of a new opening into the cavity at a point of election, is necessary. This method has been carried out in ten cases. In six cases, sterilization and closure were accomplished in from fourteen to seventy days, and the six patients have remained well for from seven months to three years. In all of these cases the sinus tract was closed over an intrapleural cavity. Subsequent x-ray examinations of four patients show that the cavities, even though surrounded by a markedly thickened pleura, have been spontaneously obliterated and that the thickened a pleura has largely disappeared.

The immediate sterilization of empyemic cavities with pure carbolic acid and complete closure at the time of operation have been carried out in five cases. In each the cavity was small (up to 200 c.c. in capacity) and favorably situated. Two of these cases healed by primary intention and remained healed. The wound of the third case became indurated and red, and was opened, with infection of the cavity, which was later sterilized with Dakin's solution and closed by secondary suture. The reports of the other two cases are missing.

Hemorrhage following the irrigation of empyemic cavities with Dakin's solution has occurred in three cases. It was never excessive and ceased as soon as the irrigations were discontinued. The development of bronchial fistulae has prevented the continuation of the irrigations because of its disagreeable effects upon the respiratory tract.

F. R. SANDERSON.

LATE RESULTS AFTER THE RADICAL OPERATION FOR CANCER OF THE BREAST: Willy Meyer, (Ann. of Surg., vol. 72, Number 2, p.p. 177-180). The radical operation for cancer of the breast that the author has practiced since 1894 starts in the axilla and works toward the sternum, and consists of the removal of the lymph nodes and axillary fat before the removal of the cancerous breast. He has not seen a lasting cure when the operation has been done in two stages, the first stage, the removal of the breast with the axillary contents, and the second stage, the excision of the pectoralis major muscle.

The author reports six cases in which the patients are alive and well from twelve to twenty-five and one-half years after operation. Five other patients remained free from recurrence for four, six, eight (two patients), and sixteen years, respectively, and then died from other diseases. Another patient, a pronounced diabetic at the time of operation, was well for six years, and then succumbed to the diabetes without any recurrence of the cancer. Still another patient upon whom a radical operation was done for cancer in the right breast returned one year and eight months later with a carcinoma of the left

breast, which was removed, and at the time of the last report she had been free from recurrence for six and one-half years after the second operation.

The author calls attention to Paget's disease, which he terms the most malignant of all cancers of the breast. He reports three cases; all of the patients died from metastasis. In each case, however, operation had been late.

Involvement of supraclavicular glands in cancer of the breast does not present a contra-indication to operation, but none of the patients who remained well for from twelve to twenty-five years and one-half years had the supraclavicular glands involved.

V. C. Hunt.

THE RUBBER TUBE IN INTESTINAL SURGERY: Balfour (Surg. Gyn. and Ob., Vol. 31, No. 2) points out that ineffective attempts are occasionally met with in closing colostomies. Successful closing sometimes requires enough suturing of the opening in the bowel to contract the lumen beyond what appears to be the limit of safety. The rubber tube serves a useful purpose by preventing further contraction; and by conveying gases and fecal matter past the point of closure it gives the best possible condition under which healing may occur. In these cases the tube is introduced through the colostomy and passed out the anus, leaving the upper end 3 or 4 inches above the point of closure. The tube is removed in about 10 days.

The mechanical functions of the tube are chiefly called upon in its employment in axial anastomosis, closure of colostomy and fecal fistula repair. Further important mechanical function of the tube is observed in its action as a splint. Its use in this capacity is advantageous in cases in which extensive scar, due to previous operations or the adhesions of inflammatory exudate are present and there is danger of post-operative obstruction. The use of the tube is also recommended in certain disturbances in the neuro-muscular mechanism of the intestinal tract. The article is accompanied by several case reports and illustration which make the article very instructive.

E. M. Jones.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:

ARCHIBALD L. McDONALD,
FIDELITY BLDG., DULUTH.

ALBERT G. SCHULZE,
LOWRY BLDG., ST. PAUL.

UTERINE FIBROIDS IN PREGNANCY: Aime Paul Heineck, (Chicago Med. Rec., July, 1920. This is as the author states "an analytic study of personal cases not previously published and of three and eighty cases collected from the literature, all operatively treated." The author refers to one hundred and forty-six articles in both domestic and foreign literature.

He discusses every phase of the question, etiology, variability, number, size, shape, relations, seat, classification, and mechanical disturbances; nutritional, inflammatory and degenerative changes, concomitant pathologic conditions, diagnosis of pregnancy and fibroids, pressure signs and symptoms, and those of inflammatory and degenerative changes; influence on woman's fecundity, on gestation, labor and puerperium. Finally he discusses the treatment, expectant and operative, the latter including abortion, myomectomy caesarean section, vaginal and abdominal, and hysterectomy, and gives the advantages and disadvantages of each.

Albert G. Schulze.

THE CHEMISTRY OF ACIDOSIS: Leon Jonas (Therapeutic Gazette, July 15, 1920). The ability of the blood to maintain its constant reaction and as a result a constant H-ion concentration is due to the presence of two weak acids, phosphoric and carbonic, and their sodium salts, chief of which is sodium bicarbonate. The normal bicarbonates of the blood yield from 60 to 70 vol. per cent of carbon dioxide and any reduced yield is due to accumulation of acids. This has led Van Slyke to define acidosis as a decrease in the bicarbonate content of the blood.

When a foreign acid enters the blood (endogenous or exogebous) it unites with the sodium bicarbonate to form a neutral salt and carbon dioxide is liberated. The greater the amount of foreign acid, the greater is the demand on the alkaline reserve with resulting reduction in the blood bicarbonate. The bicarbonate and H-ion concentrations of the blood are constant in normal individuals and the latter increases only in the late stage of acidosis when the supply of bicarbonate in greatly reduced.

The H-ion concentration bears a very direct relationship to the ratio of the carbon dioxide existing in the form of carbonic acid and that in the form of sodium bicarbonate. This ratio has been found to be 1:20 in normal individuals and changes only when the sodium bicarbonate is greatly reduced. This is maintained through pulmonary ventilation and as long as it remains at 1:20 we have a compensated acidosis no matter how low the bicarbonate may be. Pulmonary failure brings about an uncompensated acidosis and increased H-ion concentration.

The alveolar carbon dioxide tension and the blood carbon dioxide content are both tests for acidosis.

Rapid and deep breathing, Kussmaul breathing, is nature's method of over coming an increased H-ion concentration which has resulted from carbon dioxide accumulation, in cases of acidosis. The other way of exit is by way of the kidneys. Normally 4 Gms of soda bicarbonate will alkalanize an acid urine; failure to do so diagnoses a case of acidosis (Sellard's test). This test is safe only with normal

kidney elimination; in other caes carbon dioxide determinations must be resorted to.

There are two types of acidosis, that arising from failure of kidney elimination or retention-acidosis seen chiefly in glomerular nephritis. The second type is metabolic and due either to incomplete combustion of fat as in starvation or inability to utilize carbohydrates as in diabetes. This second type is found also in starvation, cyclic vomiting and undernutrition of all types.

There is also the acidosis of shock and a mild acidosis is found in eclampsia, acute infections and decompensations, etc.

ALBERT G. SCHULZE.

RELATIVE VALUE OF RADIUM AND SURGERY IN THE TREATMENT OF TUMORS OF THE PELVIC ORGANS: J. G. Clark (Ann. of Surg., June, 1920). This report on the results of radium therapy from one who is primarily a surgeon, is of particular interest to the general profession. The experience of Dr. Clark and his staff at the University of Pennsylvania Hospital is sufficiently broad to give great weight to his conclusions which as yet are stated conservatively but with with increasing definitness in each report. As regards myomata, modern surgery offers such excellent results and with such low mortality, that there is not great demand for non-operative treatment. In the author's clinic, operation is selected for the larger tumors and those presenting special complications, in other words for the more serious cases. Their mortality was only 2 per cent for the last 100 patients, yet during the same period 110 tumors were treated satisfactorily with radium with no mortality, and practically no morbidity. Degenerations and malignant complications present special problems. (1) Cancer of the funds complicated myomata in 4 per cent of 850 cases, but the correct diagnosis had been made previous to operation in practically all. The type of bleeding is differentiated between myoma which is rarely destructive, causing menorrhagia with clean cut intermenstrual intervals; and cancer, which soon causes destruction of mucous membrane and is associated with metrorrhagia or intermenstrual bleeding of varying intensity. The author feels that with ordinary care there is slight danger of overlooking cancer. (2) Certain benign degenerations give more concern, due to absorption of toxic materials resulting in cachexia and anemia not accounted for by loss of blood. The author believes that such absorption from liquefying tumors after radium is not desirable. Also, that large tumors undergoing hyaline change are not greatly affected by radium. Therefore he does not advise radium for myotata larger than a three months pregnancy. (3) Sarcomatous degeneration he regards as exceedingly rare and not a serious contraindication to radium. He excludes from such treatment the following types of cases. (1) Tumors exceeding the size of a three months pregnancy, unless there be marked contraindication to operation. (2) Cases with symptoms of inflammatory lesion, marked unilateral pain or tenderness, since there is serious possibility of stimulating dangerous activity. (3) Patients with nearly normal menstruation who show definite cachexia or anemia. (4) All cases with symptoms of co-existing abdominal surgical lesions. In other words he accepts for radium, only those patients with relatively small tumors causing menorrhagia as the chief symptom. In young women operative treatment is favored, since many cases permit of simple myomectomy, or at least, the menopause may be avoided. When radium is used in such cases, mild doses are advised, and repetition if necessary. Result of 150 patients treated with radium, only 4 were unrelieved and required subsequent hysteroctomy. The menopause is abrupt, especially in the anemic. With cancer of the cervix, radium treatment is more popular on account of the large number of inoperable cases, high operative mortality, and frequency of recurrence. As with operative treatment, there is great variation in results with radium. However the author has a number of advanced and seemingly progressive cases which cleared up with radium and have gone several years without recurrence. The following considerations are emphasized. Bleeding and discharge are usually controlled. Pain may occur after radiation but is not as severe as with the untreated cases. Propaganda should teach that while early cancer is painless, late cancer is always accompanied by severe pain. Fistulae, vesico-vaginal and recto-vaginal, occurred in a few instances, but less frequently than in the untreated. Operation is advised in frankly operable cases, though there is greater tendency to limit the field of operability and use radium for doubtful tumors. Brief radiation is used previous to operation. Operation is not advised following marked improvement from radium because surgery has little more to offer, the scar tissue resulting from radium, renders dissection of the broad ligaments difficult, and there is danger of stirring up and implanting cancer cells which have been encapsulated. Conclusions: (1) Radium is the treatment par excellence for inoperable cases. (2) Borderline cases are treated with radium rather than subjected to the risk of radical operation. Early cases are operated on, and followed by post-operative radiation. (3) Cancer of the fundus even advanced is treated with hysterectomy except in the face of grave contraindication. As yet the author can claim no cures but hopes soon to report some who have passed the five year period.

ARCHIBALD L. MCDONALD.

PEDIATRICS

SUPERVISORS:

FREDERICK C. RODDA,
SYNDICATE BLDG., MINNEAPOLIS.

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO.

THE EFFORT SYNDROME IN CHILDREN: Charles Gilmore Kirley, (Arch. of Ped., Aug., 1920). The boy or girl presenting this syndrome comes with a history of absence of capacity for sustained effort, both mental and physical. Physical development and nourishment may be up to par. The intelligence may be normal. A thorough physical examination fails to show disease. Scholarship is poor. No interest is shown in sports and contests. They are simply poor types of humans of 50 to 75 per cent capacity. They are not to be confused with the child temporarily below par from rapid growth, poor food, bad habits or acute illness.

Analagous to this class among adults were the recruits in the army who failed in endurance under the army routine. To this condition Dr. Thomas Lewis applied the term "effort syndrome". Later writers recognize the condition as "neuro-circulatory asthenia" or "neuro-circulatory myasthenia" (MacFarlane) since the most prominent symptoms are from the side of the nervous and circulatory systems.

The author cites a series of illustrative cases and makes a plea for the recognition of this type of child. He or she is constitutionally inferior, substandard and too much must not be demanded. For economic reasons, to prevent the waste of misfits, an expert occupational diagnostician is needed. These individuals may do well in business or clerical spheres where they would fail in stations demanding high scholarship, executive ability, or sustained, severe physical effort. The curriculum and vocation should be fitted to the child rather than the child forced and driven to fit the curriculum.

Physicians and educators should appreciate that what often passes as indifference and indolence may be constitutional in origin and impossible of correction.

F. C. Rodda.

THE DIETITIC TREATMENT OF SUMMER DIARRHOEA: J. P. Crozer Griffith (Arch. of Ped., Aug., 1920). Since errors in feeding with consequent acute indigestion and intoxications usually precede an infectious diarrhoea the author, properly, concludes that the dietetic regime is, in general, the same for the various diarrhoeas. He places great emphasis on prophylaxis. He quotes, Still to the effect that 2,000 to 4,000 infants under one year of age die annually in London from diarrhoeal disease, also Hermann's figures of 33 per cent of infant deaths in Berlin, in the first year, as due to digestive disturbances. A further fact that artificially fed infants show five times the mortality seen in those breast fed leads to the obvious inference that maternal feeding is the greatest prophylactic factor in summer diarrhoeas. Especial efforts should be made to nurse the baby for the first three months and during the hot summer season.

If the infant is of necessity artificially fed the cleanest milk should be employed and that should be heated. Danger of heated milk causing scruvy is overestimated and in any event orange juice is a safe preventative. The milk mixture should be a proper one and underfeeding should be preferred to overfeeding.

Diet during diarrhoea—Diet is by far the most important factor. After an initial purge and a starvation period up to twenty-four hours, a suitable food should be selected. Since fats and sugars are often causitive factors or at least poorly tolerated during the attack these must be present in the mixture in minimal amounts. On the other hand protein and amylaceous substances with a large water intake are indicated. The indications may be met first by barley water—broths thickened with amylaceous substances, buttermilk mixture, case in milk, skimmed milk and malt soup.

Each case must be studied in detail and treated as an entity. Milk on which the child has been thriving may even become an active poison during diarrhoeal diseases. Relapses are prone to occur and the mother must be cautioned against impatience. After the summer is over and recovery is complete a rapid gain in weight is to be anticipated.

F. C. Rodda.

THE ANTINEURITIC AND GROWTH STIMULATING PROPERTIES OF ORANGE JUICE: Albert H. Byfield and Amy L. Daniels, with the cooperation of Rosemary Loughlin, (Am. Jour. of Dis. of Child., May, 1920). Orange juice has been so universally regarded as an antiscorbutic, that its other possible properties as effecting the well-being of artificially fed infants have not received much consideration. The therapeutic effects of the addition of orange juice to the diets of infants suffering from scurvy has been studied by Hess. When orange juice was given, not only did the usual scurvy symptoms disappear, but the children gained in weight and the cardiac signs became normal. The omission of the orange juice was followed by a period of stationary weight until it was again added to the diet.

Hitherto, oranges, and fruits in general, although valuable antiscorbutics, have not been regarded as sources of the antineuritic vitamin. Since the antineuritic value of oranges had not been determined, it seemed pertinent to study them from this standpoint, especially in respect to their influence on growth. From preliminary studies of the influence of orange juice on the growth of rats, it was roughly estimated that 45 c. c. of orange juice should stimulate growth, and when this amount was given to infants there was

a marked stimulation of growth, but in cases where only 15 c.c. was used there was none but the weight again became stationary.

Seidell, and later, Harden and Zilva have shown that the antineuritic vitamin may be removed quantitatively from a substance containing the two vitamins by adsorption, and the antiscorbutic material remain unaffected. When 45 c.c. of this filtrate per day was given to babies there was no increase in weight, but when the orange juice was given again there was an immediate gain of weight.

That orange juice contains a growth stimulating material is further evidenced by the fact that rats fed a purified ration, with orange juice as the sole source of the antineuritic vitamin, grew normally. That orange juice contains a considerable quantity of the antineuritic vitamin was also shown by its effect on polyneuritic pigeons. These birds, previously fed polished rice for from twenty-one to thirty-seven days, developed typical polyneuritis, with muscular weakness, retraction of the neck, and paralysis of the muscles of deglutition. One of these pigeons, suffering from almost complete paralysis of respiration, was quite restored by the next morning, after the subcutaneous and oral administration of orange juice on the previous evening. While the other pigeon which was given the filtrate from which the vitamin had been abstracted did not recover but died after four days.

These facts lead us to conclude that orange juice shaken with kaolin and filtered loses its growth stimulating property, while its antiscorbutic potency is not impaired.

The growth stimulating influence of orange juice appears to be due to the antineuritic vitamin contained therein. ROY N. ANDREWS.

ROENTGENOLOGY

SUPERVISORS:
C. U. DESJARDINS,
MAYO CLINIC, ROCHESTER.
R. G. ALLISON,
SYNDICATE BLDG., MINNEAPOLIS.

THE X-RAY AS A MEANS FOR THE DIFFERENTIAL DIAGNOSIS OF TUMORS: Von L. Seitz and H. Wintz (Munchener Medixinische Wochenschrift, June 4, 1920). The authors consider that a myoma of the uterus that is suspected of a sarcomatous change should not be rayed with the castration dose of 34%, but must be rayed with the sarcoma dose of 60-70% of the erythema dose. The differential diagnosis, whether one has to do with a sarcoma or a myoma, can be determined with greater surety from the results of the x-ray treatment. Especially if the retrogression of the tumor begins after several days, if it is very apparent after 14 days, and more or less complete after 4-5 weeks, then one is dealing with a sarcoma. If on the other hand the retrogression sets in first after 3-4 months, if it proceeds slowly and is complete only in the course of 1-2 years, then one is dealing with a myoma. The shrinking of the myoma is a secondary matter which appears only in consequence of a lack of ovarian activity.

Because the cells of different malignant tumors, being unripe quickly differentiating cells, have a greater susceptibility to x-rays than the mature cells of clinically benign tumors, often the effects of x-ray on the tumor gives the diagnosis between benign and malignant growths. Lymphosarcoma reacts very markedly and quickly, while on the other hand tuberculous glands retrogress very much slower.

Also in the case of differential diagnosis of sarcoma and carcinoma, in many cases the effects of x-ray shows first the difference whether one is dealing with sarcoma or carcinoma. Large ovarian and abdominal sarcomas react very quickly and markedly to x-ray treatments, carcinomas on the other hand, if the carcinoma dose is not reached or only partially reached, react very slowly and transitorily.

R. G. ALLISON.

OSTEOCHONDRAL TROPHOPATHY OF THE HIP JOINT — LEGG'S DISEASE: W. E. Reiley (Amer. Jour. of Roent., July, 1920). This condition was first described by Arthur T. Legg in 1909. Reiley has found that the incidence of this condition as observed at his hospital has been exactly the same as for congenital dislocation of the hip and tuberculosis of the hip joint. He reports four cases. The age of onset was from six to ten years. Two occurred in boys and two in girls. In three cases the right hip and in one case the left hip was affected. Pain was observed in only one case. There was a history of trauma in only one case. There was a distinct difference in the muscular development of the lower extremities in the two boys and to a less extent in the two girls which were earlier cases.

From the standpoint of roentgen diagnosis the condition presents the following findings. There is a marked thickening of the neck of the affected femur. The acetabulum shows somewhat variable density and the rim is irregular and roughened. Two cases showed an area of decreased density of the diaphysis bordering the epiphyseal line, which is irregular in all.

He emphasizes the necessity of roentgen differential diagnosis of affections of the hip joint, especially to avoid confusing this condition with tuberculosis of the hip.

R. G. ALLISON.

BOOK REVIEWS

STANDARD NOMENCLATURE OF DISEASES AND PATHOLOGICAL CONDITIONS, INJURIES, AND POISONINGS, for the United States Department of Commerce, Bureau of the Census, Sam. L. Rogers, Director. Washington Government Printing Office, 1920.

This nomenclature is a first edition and necessarily mistakes have been made in it which will be rectified by subsequent editions. It is a very long step in the right direction. Too long indeed has medical terminology been a subject largely of whim and caprice. The diseases are known by too many different names and in many instances the names do not suggest anything connected with the illness itself. Efforts to popularize such a nomenclature as is here produced have been carried on for a period of more than fifty years. In any of the other sciences such as botany no such confusion of terminology exists. Unless one name is used for each flower the greatest difficulty would be encountered in discussing any botanical subjects. In American medical terminology uniformity of expression should also be present. It facilitates the interchange of ideas. Without this uniformity a condition very like that which existed during the construction of the Tower of Babel is present.

An attempt is here made to combine the nomenclatures of the Bellevue and Allied Hospitals of New York with those of the medical departments of the Army, the Navy, the Public Health Service, and to this end the War Risk Insurance Bureau and the Council of National Defense were also consulted. Subsequently the Classification of Diseases of the Massachusetts General Hospital, the List of Diseases and Pathological Conditions, Stanford University Department, and the Nomenclature of Diseases, Royal College of Physicians of London were included in the consolidation.

Many terms are given which some physicians may regard as symptoms of a known disease. The printing of the primary disease in boldfaced type suggests the preference to be given.

The work is divided into sections dealing with "Diseases and Pathological Conditions," a section dealing with "Injuries, Wounds, etc., by External Causes," which is prefaced by the remark:

> "In all statements of injuries the cause or manner of the injury should be given and information as to whether the injury was accidental, suicidal, homicidal, etc., should be included."

The third section deals with "Poisonings and Intoxications."

It is greatly to be hoped that as time goes on medical writers will accept this governmental nomenclature as standard nomenclature and thereby do much to place the practice of medicine on the basis of an exact science.

C. A. Smith, Jr.

HYGIENE-DENTAL AND GENERAL. By Professor C. E. Turner. C. V. Mosby Co., St. Louis, 1920. $4.00.

We have witnessed many times the necessary need for a sound mind and a sound body and are cognizant of their direct relation to health and happiness but heretofore we have had no single work, to my knowledge, where one may get such a general idea of the relation of clean mouth to a clean system. Whether we are dealing with primary or secondary infections it behooves us to have every link in the chain in as perfect working order as possible.

Other books have dealt with certain single topics brought out by Professor Turner but as far as I know none has brought the many topics together in the manner in which he has. He has generalized considerably but in order to cover his field it has been necessary for him to be more or less brief. If he were to treat the subject exhaustively, he might write a book on any one of his chapters.

We dentists, in order to be prepared for the increasing demands made upon us by school and factory organizations, must obtain a broader knowledge of hygiene and its application.

Professor Turner has given a comprehensive study to his topic and put the same into this fine book.

Carl J. Rice.

THE DUODENAL TUBE AND ITS POSSIBILITIES. By Max Einhorn, M. D. W. B. Saunders Co., Philadelphia, Pa., 1920. $2.50.

Einhorn presents many new features in the finer details of gastro-intestinal conditions, both therapeutically and diagnostically.

Starting with the early works of Boas in 1889, Boldgreff, Pawloff, etc., he gives a brief and concise resume of the development of the duodenal tube.

There is a chapter devoted to the physiology of the duodenum, normal and pathological, together with methods of determining qualitatively and quantitatively the various ferments in the duodenal juice.

Its importance in the diagnosis of gastric, duodenal, hepatic and pancreatic disease is brought out in another chapter.

Duodenal alimentation and lavage is an added feature of the duodenal tube. Einhorn advocates its use in many diseases and in post-operative treatment.

Various accessories or modifications of this tube for the investigation and treatment of diseases of pylorus, duodenum and small intestines are described in detail.

On the whole, Professor Einhorn has presented in a very clear and concise and exhaustive manner a subject which will assume greater importance in the diagnosis and therapeusis of gastro-intestinal diseases.

C. K. Williams.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

PHYSICIANS LICENSED TO PRACTICE IN THE STATE OF MINNESOTA, APRIL, 1920

BY EXAMINATION

Name—	School and Date of Graduation	Address—
Appleby, John Isaac	U. of Minn. M. B. 1920	St. Paul, c/o City Hospital.
Anderson, David Derricks	U. of Minn. M. B. 1920	Minneapolis, 2811 E. Franklin Av.
Anderson, Frank Joseph	U. of Minn. M. D. 1917	Minneapolis, 2931 18th Av. S.
Arvidson, Carl Gustav	U. of Minn. M. B. 1920	Minneapolis, 1004 E. 15th St.
Badger, Lucius Franklin	U. of Minn. M. B. 1920	Minneapolis, 329 Union St. S. E.
Benjamin, Walter Glevae	U. of Minn. M. B. 1920	Hutchinson, Minn.
Blaustone, Henry H	U. of Minn. M. B. 1920	Minneapolis, 2524 4th Av. S.
Borgeson, Egbert John	U. of Minn. M. B. 1918	Hanska, Minn.
Branton, Alloys Franklin	U. of Minn. M. D. 1920; U. of Minn. M. B. 1919	Willmar, Minn.
Cantwell, William Findlay	U. of Minn. M. B. 1920	White Bear, Minn.
Christianson, Harry Walter	U. of Minn. M. B. 1920	Minneapolis, Swedish Hospital.
Countryman, Roger Simmons	U. of Minn. M. B. 1920	St. Paul, 213 S. Avon St.
Crow, Earl Roy	U. of Minn. M. B. 1920	Minneapolis, 421 6th St. S. E.
Crowl, Verne Chase	U. of Minn. M. B. 1920	Minneapolis, 610 E. 15th St.
Culligan, John Maurice	U. of Minn. M. B. 1920	St. Paul, 2069 Iglehart.
Curtin, John Francis	Harvard, M. D. 1915	Minneapolis, Plaza Hotel.
Daniels, Harry Anthony	U. of Minn. M. B. 1920	Two Harbors, Minn.
Doyle, George C	U. of Minn. M. B. 1920	West Duluth, 29 53rd Av. N.
Doyle, Lawrence Oscar	U. of Minn. M. B. 1920	Minneapolis, 506 Oak St.
Flagstad, Albert Edward	U. of Minn. M. B. 1920	Minneapolis, 4833 27th Av. S.
Flores, Miguel Angel	U. of Pa. M. D. 1918	Rollingstone, Minn.
Ford, Frances A	U. of Minn. M. B. 1920	Minneapolis, 245 Irving Av. N.
Fowler, L. Haynes	U. of Minn. M. B. 1920	Minneapolis, 2808 Girard Av. S.
Gault, Charles Cullom	U. of Minn. M. B. 1920	Minneapolis, 500 Delaware St. S. E.
Gunderson, Nels Andrew	U. of Minn. M. B. 1920	Minneapolis, Swedish Hospital.
Henry, Myron Ormell	U. of Minn. M. B. 1920	Minneapolis, 958 26th Av. N. E.
Hoffman, Max Harold	U. of Minn. M. B. 1920	St. Paul, 1378 Ashland.
Holley, Wm. Henry Wallace	U. of Minn. M. D. 1917	Halstead, Kans.
Hultkrans, Joel Carl	U. of Minn. M. B. 1920	St. Paul, 1608 Van Buren.
Hutchinson, Chas. Joseph	U. of Minn. M. D. 1917	Minneapolis, 3806 Blaisdell Av.
Jackson, Arnold S	Columbia U. M. D. 1919	Rochester, Minn.
Johnson, Ellsworth Julian	U. of Minn. M. B. 1920	Minneapolis, 2432 Bryant Av. S.
Juergens, Herman Morlock	U. of Minn. M. B. 1920	Minneapolis, 329 Union St. S. E.
Kadesky, David	U. of Minn. M. D. 1918	Minneapolis, 219 Harvard St. S. E.
Kinsman, Frank Cyrenus	U. of Minn. M. B. 1920	Minneapolis, St. Mary's Hospital.
Larson, Leroy James	U. of Minn. M. B. 1920	Minneapolis, 329 Union St. S. E.
Lundholm, Arthur Maurice	U. of Minn. M. B. 1920	St. Paul, 1514 Lincoln Av.
Mahowald, Aloys	St. Louis U. M. D. 1920	Duluth, St. Mary's Hospital.
Mayer, Lillian M	U. of Minn. M. B. 1920	Great Falls, Mont.
Mills, John L	U. of Minn. M. B. 1920	Pelican Rapids, Minn.
Miners, George Alfred	U. of Minn. M. B. 1920	Minneapolis, 329 Union St. S. E
Moersch, Herman John	U. of Minn. M. B. 1920	St. Paul, 1993 Ashland Av.
Morris, Ernest Henry	U. of Neb. M. D. 1919	Austin, Minn.
Muller, Rudolph Theodore	U. of Minn. M. B. 1920	St. Paul, 672 Cable Av.
Nannestad, Rolf Frederick	U. of Minn. M. B. 1920	Minneapolis, St. Barnabas Hospital.
Norrgard, Henry T	U. of Minn. M. B. 1920	Milaca, Minn.
Pedersen, Arthur Herman	U. of Minn. M. B. 1920	St. Paul, 75 S. Victoria.
Peterson, Willard Carl	U. of Minn. M. B. 1920	Minneapolis, 1023 21st St. E.
Platou, Erling S	U. of Minn. M. B. 1920	Minneapolis, 429 Union St. S. E.
Ryan, Mark Edward	U. of Minn. M. B. 1920	Minneapolis, 329 Union St.
Robinson, Byron Lewis	U. of Minn. M. B. 1920	Minneapolis, 44 Melbourne Av.
Rosenholtz, Burton	U. of Minn. M. B. 1920	St. Paul, 819 Portland.
Salt, Clifford Green	U. of Minn. M. B. 1920	Minneapolis, 317 9th Av. S. E.
Seaberg, John Arthur	Northwestern, M. D. 1920	Minneapolis, 914 Elliot Av.
Steffens, Leon Alex	U. of Minn. M. B. 1920	Minneapolis, 3328 Portland S.
Stratte, Harold Conrad	U. of Minn. M. B. 1920	Dawson, Minn.
Strong, Geo. Frederic	U. of Minn. M. B. 1920	St. Paul, 436 Portland Av.
Sullivan, Raymond Michael	U. of Minn. M. B. 1920	Minneapolis, 1211 Chestnut Ave.
Vik, Arthur Elliott	U. of Minn. M. B. 1920	St. Paul, 1815 Iglehart.
Widen, Wilford F	U. of Minn. M. B. 1920	Minneapolis, 2836 Bloomington Av.
Zanger, Henry George	U. of Minn. M. B. 1920	Minneapolis, 3037 Emerson Av. S.

LICENSED THROUGH RECIPROCITY

Bell, Charles Curry	Rush, 1919	St. Paul, City Hospital.
Davis, Benjamin Franklin	Rush, 1912	Chicago, 122 S. Michigan Av.
Gibson, Paul Edison	U. of Iowa, 1919	Crookston, Minn., Box 247.
Grigsby, Roll O.	Rush, 1916	Rochester, Minn.
Hall, Cluley Calvin	U. of Iowa, 1919	Rochester, Minn.
Hartman, Howard Russell	U. of Mich, 1914	Rochester, Minn.
Schulberg, Peter Arthur	U. of Ill., 1914	Minneapolis, 1031 13th Av. S. E.
Smith, Cyril McNutt	Northwestern, 1918	Coleraine, Minn.

LICENSED UNDER THE LAWS OF 1919
(OVERSEAS SERVICE SIX MONTHS OR MORE)

Allison, Robert Glenn	U. of Maryland, 1912	Minneapolis, University Hospital.
Chaney, Ralph Hill	U. of Pa., 1914	Rochester, Minn.
De Tuncq, George P.	Hah. Chicago, 1917	Wausau, Wis., 520 3rd St.
Elliott, Leo Louis	Geo. Wash. U. D. C. 1910	Warroad, Minn.
Garrison, Herbert Thomas	Bennett, 1915	Keens, Ill.
Grove, Arthur Francis	U. of Ill., 1910	Dell Rapids, S. D.
Hundling, Herman William	U. of Ia., 1915	Rochester, Minn.
Leonard, Veader Newton	Johns Hopkins, 1911	Rockford, Ill., (Windsor Apt.)
Levinthal, Daniel Harold	Chic. Coll. Med. & Surg. 1917	Chicago, 1251 S. Harding Av.
Linhardt, Oscar Vernon Norbert	U. of Maryland, 1915	Bancroft, Ida., P. O. Box 177.
Mackedon, Thos. Edward	Marquette, 1913	Post Hosp., Ill., Rock Island Arsenal.
Mastin, Edward Vernon Metcalfe	U. of Pa. 1916	Rochester, Minn.
Murphy, Walter Waugh	Northwestern, 1911	Gilbert, Minn.
Myre, Stanley Lawrence	Marquette, 1915	Minneapolis, 3428 5th Av. S.
Parker, Bennett Roland	Rush, 1916	Rochester, Minn.
Rankin, Fred Wharton	U. of Maryland, 1909	Rochester, Minn.
Sayers, Frank Eugene	U. of Mich., 1913	Rochester, Minn.
Schlesselman, Geo. Herman	Hah., Chicago, 1913	Fond du Lac, Wis., 47 S. Main St.
Wagener, Henry Patrick	Med. Coll. So. Carolina, '13	Rochester, Minn.

PHYSICIANS LICENSED TO PRACTICE IN THE STATE OF MINNESOTA, JUNE, 1920

BY EXAMINATION

Andrews, Clayton Farrington	U. of Pa. M. D. 1916	Rochester, Minn.
Brown, Richard Joseph Carroll	U. of Minn. M. B. 1920	Minneapolis, 608 E. 14th St.
Deane, Helen M.	U. of Minn. M. B. 1920	Minneapolis, c/o University Hospital
Drips, Della G.	U. of Minn. M. B. 1920	Rochester, Minn.
Foster, William Kerr	U. of Minn. M. B. 1920	Minneapolis, 714 University Av. S. E.
Gutsell, Robert Squier	U. of Minn. M. B. 1920	St. Paul, c/o St. Lukes Hospital.
Kriz, Rose Alice	U. of Minn. M. B. 1920	Milwaukee, Wis., 3826 Vliet St.
McCartney, James Shearer, Jr.	Johns Hopkins, 1917	Rochester, Minn.
McFarlane, Lloyd E.	U. of Minn. M. B. 1920	Minneapolis, 509 River Road E.
McKinlay, Chauncey Angus	Kansas Univ., 1916	Minneapolis, University Hospital.
Myers, Jay Arthur	U. of Minn. M. B. 1920	Minneapolis, General Hospital.
Richdorf, Lawrence Francis	U. of Minn. M. B. 1920	Minneapolis, c/o University Hospital.
Rypins, Harold Levi	Harvard, 1919	St. Paul, 210 S. Victoria St.
Ziegler, Lloyd Hiram	U. of Minn. M. B. 1920	Minneapolis, 4544 45th Av. S.

THROUGH RECIPROCITY

Baldwin, Otis Johnson	Marion Sims, 1903	Coleraine, Minn.
Busman, George J.	U. of Mich., 1918	Rochester, Minn.
Derauf, Benjamin Irving	U. of Iowa, 1919	Brainerd, Minn.
Goeckermann, Wm. Henry	Wis. P. & S., 1906	Rochester, Minn.
King, Frank Lambert	Pulte, 1888	TimberLake, S. D.
McCall, Harry Kenyon	U. of Ill., 1901	Waterloo, Ia., 306 1st Natl. Bk. Bldg.
Page, Clarence Vernon	U. of Iowa, 1902	Sheldon, Ia.
Rowley, Walter Nelson	Northwestern, 1918	Rochester, Minn.

MINNESOTA MEDICINE

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ORIGINAL ARTICLES

SOME MEDICAL TRAITS AND THEIR CONSEQUENCES*

J. H. ADAIR, M. D.
Owatonna, Minn.

Members of the Minnesota State Medical Association, Ladies and Gentlemen:

In compliance with that provision of our constitution which not only allows but prescribes the infliction of an address by your President at this time, I have chosen to speak to you for a brief time upon some traits and characteristics of our profession, as they have occurred in years gone by, and as they may be modified in the years to come.

The healing art throughout the ages and down to modern times, let us admit at once, has been but a strange compound of credulity and superstition, superimposed on a foundation of fantastic theories, and owing scant allegiance to the demonstrated truths of the knowledge of its day. Dogma and empiricism long held the ascendency in all which affected the welfare of the profession, and its votaries were content to fashion their activities mainly after the prevailing theological tenets of the time, and place upon an already overworked but complacent Providence the responsibility for their failures and the credit for their blundering successes.

Current medical belief rested on no sure foundation of inductive reasoning—the handmaiden of scientific truth—for of science there was none. Instead, warped and distorted conclusions based upon the observations of misinterpretated phenomena were made to fit the exigencies of all conditions affecting humanity with little or no regard for their importance or validity so long as they served to maintain intact the theory they helped to uphold.

So it was that successive generations of physicians found themselves the disciples of new doctrines reared upon the discarded fragments of those once accepted by their predecessors, as the ultimate embodiment of truth, and in time, perchance, lived long enough to witness the overthrow of those to which they had given implicit adherence themselves.

Moreover the practice of his art by the physician was surrounded by a veil of impenetrable secrecy deemed necessary doubtless for the protection of his dignity of which he was apt to have a hyper-acute conception, and in witness of his sincerity in respecting and holding inviolate the fanciful and erratic theories regarded as the essentials of his calling, he bound himself by an oath the faithful observance of which was evidence of his integrity and the hall-mark of his professional standing as well.

As the dubious sources from which his professional knowledge was derived had their origin largely in the ipse dixit of some forgotten leader whose memory and teachings were evidenced mainly by a startling increase in the mortality bills of the time, he stored his mind to its full capacity with the outworn minutiae of venerated but useless concepts and pursued the fatuous path of his calling blissfully unconscious of the havoc he wrought upon a defenseless public, and less of a menace only in the degrees to which his Creator had endowed him with the saving grace of common sense.

If perchance, at times some dim and half-formed conception of the physical relations existing between humanity and the universe dawned upon him, he argued from false premises to equally false conclusions, for the ground on which he stood was but the shifting sands of controversial discord through which he made but sorry progress toward the faint and slow-dawning light of exact knowledge.

*President's address before the Minnesota State Medical Meeting, October, 1920.

The inevitable result of this discordant condition of affairs, so far as the individual fortunes of the physician were concerned, was in the main unsatisfactory at best.

He, who, imbued with the laudable desire for improvement in his daily labors, and here and there such brave and pioneer souls were to be found, attempted the arduous task of righting the physical wrongs of humanity by better and more rational means, found himself walled about by well-nigh impenetrable barriers of superstition and indifference and discovered to his cost that the usual price of innovation and advancement was probable loss of position and reputation with the unpleasant liability of having invoked upon his devoted head the terrors of the law as well, a contingency, by the way, to which our modern system of jurisprudence with its peculiar veneration for precedent still continues to lend an unwarranted degree of sanction.

The peculiar relations existing between the physician and those to whom he ministers are undoubtedly responsible, in great measure, for the attitude he has generally assumed with reference to the weighty questions affecting the social fabric of which he is a part. In his domain he stands supreme: to his clientele his lightest word is law, to be implicitly believed and faithfully executed, and small wonder that it should be so when we consider that he penetrates more deeply than other men into the most intimate relations of life for, beyond the veil which hides the personality of all from the outside world, into the secret chambers of the soul itself, where none other of mankind may come, he enters and stands alone. Let it be recorded to the undying credit of the calling he professes that he comes with clean hands and a pure heart, a mind imbued with singleness of purpose and a fitting sense of his responsibility to those he serves.

The relations thus existing between the physician and the public have from time immemorial been celebrated in song and story until there has been built up around the labors of the former, a system of opinions from which he has found it increasingly difficult to extricate himself, were he disposed to do so which unfortunately has not always been the case.

The intensely personal nature of his calling which has already been alluded to, his conception of his responsible duties not to the mass but to each individual in need of his services, fostered and enhanced as it has been by tradition, by precedent, and the ethics of the profession, have succeeded in rendering distasteful to him the grasping of problems affecting humanity in the mass, and if he has not actually evaded the active consideration of the innumerable questions constantly pressing upon him from the outside he has, at best, adopted an attitude of apathy and indifference towards their successful solution.

Unfortunately for him and the public as well, the mental state engendered by this conception of his duty as one peculiarly set apart from the common interests of the community, by the very nature of his profession has fostered a spirit of reticence and aloofness, which in turn has led him to adopt an attitude of detachment and isolation in matters concerning which he should be prominent and authoritative. He has too often forgotten the patent fact, now so well recognized that the certain result of isolation and seclusion adopted as a principle of existence is the fostering of distrust, suspicion and jealousy, rank weeds in the garden of the mind, whose ripened fruit is poisonous to the full efficiency of the individual at all times.

It would be an interesting, albeit a painful and sorrowful task to determine the number of those in the profession today whose activities conform to the above crude description and who do grave injustice to their own capabilities by forsaking deliberately that healthy association and intercourse with their confreres so essential to the normal functioning of mind and heart. The reaction to this attitude of the profession on the part of the public has been typical and perhaps inevitable. Always the physician has been thought of as a unit, and in this capacity it must be admitted he stands supreme in the estimation of his individual clientele so closely does he come in contact with the lives of those about him. While so important in the estimation of those whom he ministers are the services he renders in his individual capacity that it would appear only reasonable to expect that the same degree of con-

sideration would be shown him when engaged in the wider field of public service.

But strange to say, whenever he has departed from his time-honored footing as the personal adviser of that portion of the community which he serves and has honestly endeavored to add to the importance of his teachings the weight of numbers and the authority of cooperation, his efforts have met with indifference, distrust, and ill-concealed suspicion. The broadening of his horizon and the clearer view of his ever-widening responsibilities as the physical conservator of the community, in the main, found little or no response on the part of the public, and he waged but a sorry fight for many years against the powers of ignorance and distrust. And, when, following the dictates of common sense and increased knowledge of the underlying causes of disease, he has endeavored to impress upon the community the necessity for more intelligent cooperation in the pioneer work of prevention and sanitation, among other essential measures for the conservation of the public health, the discouraging inertia of public sentiment might well lead him, in merited disgust, to apply to humanity in general, the anathema of old, "Ephriam is joined to his idols, let him alone."

In seeking a rational explanation for this apparently anomalous condition, we are led to consider the influence of his professional environment, as it modifies the routine of his daily life. The constant exercise of the very qualities of mind and heart of which I have spoken, the self-abnegation in the face of duty, the ceaseless drain upon his sympathy, the subordinating of all other demands and wishes to the call of professional obligations are all estimable in themselves and have always been recognized as inherent factors in the successful prosecution of his work. Yet in the same degree, and as the reverse of the shield shows, they have succeeded in rendering him exceedingly vulnerable to the machinations of the unscrupulous and the easy prey of the dishonorable, and unfit.

As an illustration of this, his ordinary experience in the conduct of the financial side of his business furnishes a case in point. A mistaken sense of the dignity of his profession as one too lofty and disinterested to be demeaned by the ordinary methods employed in securing monetary return for services rendered, a delusion having its origin in the ancient efforts to elevate the social status of the physician from its original menial position to one more befitting his importance, is a failing from which he he has never been able to completely free himself; for he found it permeating the essence of his professional teachings through the years of his novitiate and finally came to accept it as representing the true impression of the value of his work. It is worthy of record that this attitude of his always met with most willing and heartfelt endorsement by part of the community, which manifested its enthusiastic appreciation of these altruistic conceits of his by persistently refusing to pay him at all. Indeed so marked has this conception on the part of the public of the rights and privileges of the physician become that in general terms it may be stated that his professional popularity has always been in inverse proportion to his financial ability. And because the hoary traditions of the medical past still infect all classes of society, he finds himself inevitably placed at the bottom of the creditor list which includes not only the classical butcher, baker and candlestick-maker but the hospital, the nurse, the druggist and perchance the undertaker and sexton as well.

For this unsatisfactory state of affairs he should place the blame where he, by the way, never does, upon his own devoted and illogical head. He has paid too strict attention to what he has chosen to regard as his duty and too little to what all but himself know to be his inalienable rights, and in his occasional and abortive attempts to attain the latter, he has again found himself handicapped by the same lack of organized cooperation and fellowship, which is the direct result of his self-imposed isolation and individualistic method of life.

Lest it be thought that these criticisms of his work are biased and unjust, let me soften the blow and say that the record of his positive achievements in the perfecting of his art and the advancement of science, his singleness of purpose in all that concerns the welfare of humanity, his loyalty to the highest ideals of his

profession and his tireless expenditure of time and energy are but the more prominent when placed over against the trivial shortcomings which but emphasize the imperfections of human nature to which the best of men are inevitably disposed.

And so out of much tribulation, chiefly inherited from his predecessors, who bequeathed him the torch of knowledge it is true, but made scant provision for the clearness of its light, hampered in his progress by an entangling mesh of fallacious but persistent theories, weak where he should be strong and of small repute where he might hope for consideration, he has come in the fullness of time upon grave and momentous days and faces new conditions demanding his wisest thought and most prudent judgment.

History is punctuated by epochs of disaster, both moral and material; the cosmic forces of nature may, in a moment shatter the labor of centuries, and but yesterday, the perversions of a megalo-maniac set in motion agencies that threatened to uproot the foundations of social and civil government throughout the world.

He has read to little purpose the lessons of the past, however, who fails to see in the incidence of civilization's crises, the inevitable reaction to greater achievement; the stimulus to more intelligent effort.

Effective measures capable of preventing future disasters are inaugurated, the rights of mankind, social and political, tend to become safe-guarded to a greater extent than was deemed possible before, and for a time at least there is seen an absence of that lethargy and supine indifference to the possibilities of the future, which in all ages have been, "The cankers of a calm world and a long peace." Thus the never ending cycle of human history repeats itself throughout the ages, and the eternal purpose of omniscience unfolds as the years pass, like a scroll.

Whether the beautiful conception of world-wide and continuous amnity among the nations of the earth becomes a reality or remains but a utopian dream of the idealist does not so immediately concern us as does the consideration of the vital questions remaining as the legacy of strife.

The wide-spread epidemic of mass hysteria from which the nation is suffering, the dislocation from their fixed positions through the exigencies of war of the vast aggregation of the irresponsible, the unbalanced, and the incompetent, and their long-continued subjection to emotional and mental strains beyond their powers of readjustment, are manifesting themselves among other ways in grave social and industrial unrest, and furnish, I take it, reasonable argument for the contention that the causes of national decay and possible dissolution are primarily physical and not moral, and at the risk of being considered a visionary, let me say I am convinced that the logical and enlightened determination of these and similar pathologic conditions of the body politic, demand the attention of the medical profession, rather than the blundering efforts of the ubiquitous and self-seeking politician.

Another of the inevitable consequences flowing from the readjustment of society following such an upheaval as we have just experienced is a quickening of the social conscience in all that concerns its welfare. The community or state which willingly sent forth its sons to do battle for the right and for humanity, and accepted without murmur their wounds, their suffering and even their supreme sacrifice of life itself, are no longer apt to contemplate with resignation and indifference the sacrifice of other as valuable lives to the Moloch of preventable disease. Less so will this be true when it is fully recognized that the havoc wrought by the thus far uncontrolled maladies of modern life, veritable "Captains of the men of death" as they are, and fell-destroyers of the human race, exceed in their toll of lives and money the war-time bills of all the nations.

We are wilfully blind, I take it, if we fail to see and recognize the ultimate significance of the wide-spread propaganda for the preservation of human life and health now so prominent in the thought of the public, and which, despite its large proportions, is apparently but in its inception. The fact, and it is an augury of great good, can be recognized by all. Its significance for us depends upon the suspicion which is almost a certainty, that it has thus

far, in large measure, been independent of the medical profession, which still preserves its traditional standing with the laity as being concerned only with the restoration of health rather than its maintenance.

Notwithstanding this widespread misapprehension of the legitimate province and functions of the physician in this important work, the call is clearer than ever before, and the weight of responsibility for its successful prosecution rests heavily on the shoulders of the rank and file of the profession. Yet even here a crisis presents itself which, unless dealt with, promptly and effectively bids fair to seriously hamper the efforts of the physician and place him in a still more unenviable position in the estimation of the community. The state in the legitimate exercise of its police power, has, for many years exerted a quasi-control over part of our labors, and to this there has ever been the fullest and heartiest cooperation on the part of the profession; for it has recognized the fact that the establishment of sanitary and quarantine measures worthy of the name require more than local and individual authority, else their effect would be negligible and of no permanent benefit.

It is now proposed that there shall be instituted by the state, statutory measures, whereby, among other things, the physical welfare of a certain portion of the population shall be under the direct and constant surveillance of the government, either state or national, which shall practically commandeer for this purpose the services of the profession, and determine in all things the sufficiency of their efforts and the monetary value of their labors.

Whatever may be the ultimate result of such a scheme which history shows had its origin, apparently, in the Teutonic conception of Autocratic Absolutism, it needs no eye of prophecy to forecast the possibility of its practical application in everyday life, working grave injustice to the welfare of the profession as a whole. The assumption by the community of the direction and control of the physician's activities in any degree outside of that to which the State has undoubted right for its own protection, the necessarily subordinate capacity to which he must perforce adjust himself, does not, it seems to me, augur well for the retention of his old time and enviable position as the independent arbiter of the physical welfare of his fellow man, nor for the healthy functioning of his inherent self-respect.

Yet here again we have a practical and vivid illustration of the lethargic and unorganized attitude of the medical profession being worked out to its logical conclusion. To predicate the ultimate good or evil resulting from such measures as are now contemplated by the advocates of so-called social or industrial insurance is, to my mind beside the mark, the crucial point we should not overlook being that the physician, the most important factor in the entire scheme, is evidently deemed of such minor importance that his acquiescence has been practically taken for granted because of his presumed inability to offer serious and worth-while objection, and this for the very reasons I have endeavored to present, and have reiterated so often.

Such are a few of the many problems which the physician is called upon to meet. For the first time perhaps, in his long and varied history he confronts squarely the on-coming tide of public opinion backed by the ever-increasing enlightenment of society which insistently demands that the world shall be made physically safe for humanity. He alone is rightfully entitled by knowledge and training to lead in this holy war for the betterment and salvation of the race. Around him on every side stretch the fields of opportunity whose boundaries are as wide as the measure of his mind.

Will he enter and occupy?

APPLICATION OF WAR METHODS OF TREATING FRACTURES TO THOSE OCCURRING IN INDUSTRIAL OCCUPATIONS*

Joseph A. Blake, M. D.
and
James N. Worcester, M. D.

In the war, the gunshot fractures were the injuries which more than any others increased the length of hospitalization and the disability

*Read before the annual meeting of the Minnesota State Medical Association in St. Paul, October, 1920.

of the wounded, and the treatment of fractures was one of the chief, if not the most important, subjects at the Interallied Conferences. At these conferences the different methods were compared and an endeavor was made to indicate the forms of treatment which would give the best results. Through the influence of the conferences, but more through the individual experience of the surgeons treating fractures, especially in the centers, a number of which were established both in the English and French armies, the old treatment by fixation by splints became superseded by a treatment based on suspension in some form or another together with traction. One has only to read the reports of the Interallied Conferences to observe the marked difference in the results which were obtained by the latter method and it would be a pity if these methods found to be so superior to those in use before the war should not be generalized and elaborated for the benefit of those injured in industrial occupations. This is my reason for bringing this subject before you.

To attempt to describe all the details of the treatment by suspension with traction would take too long and would only be confusing. I shall therefore devote myself almost entirely to an analysis of the principles forming the basis of this treatment and give some of the results obtained during the past year in a general public hospital service, namely, at Bellevue Hospital in New York City.

The treatment by suspension with traction finds its greatest value in the fractures of the long single bones, namely, the femur and humerus, the fractures of which are the most difficult to treat by other methods. It is also of great value for fractures of the leg and for some compound fractures of the forearm, but, of course, there are many fractures, such as the Colles and Potts, which are more readily treated otherwise.

One of the greatest advantages of suspension for fractures of the femur and humerus is that better fixation of the fragments one upon the other can be obtained. This is not generally supposed to be the case and therefore I wish to devote a little time to explaining why it is possible. I think it can be easily understood when we look closely into the forces which tend to produce or restrain motion between the fragments. These forces arise both from within the body or limb and from without. They therefore may be termed intrinsic and extrinsic. For example, the forces producing overlapping are practically entirely intrinsic, while those producing angulation are generally extrinsic but may be both intrinsic and extrinsic. Gravitation is one of the commonest extrinsic forces, as, for example, sagging of the fragments in a fracture of the leg when encased in a plaster cast. Another extrinsic force commonly encountered when ordinary fixation is imperfect, is, when one fragment, usually the distal, is fixed and the other forcibly moved, such as occurs when a Buck's extension is applied to a fractured femur and the body is moved laterly in the bed.

In all fractures of the humerus and femur the proximal fragment tends to take a position in relation to the body which is produced by the contraction of the muscles passing from the body and inserted to it. The shorter the proximal fragment the purer is this action. If, however, the fragment is long, its position is influenced to a greater or less extent, depending upon its length, by extrinsic forces such as splints, and, to a certain extent, by the confinement of the muscles which bridge the fracture. This restraining effect of these muscles is greatly enhanced by traction upon the distal fragment because traction renders them taut. If, however, the proximal fragment is very short, their restraining action is almost negligible and only can be said to be exerted when traction is made in the direction which the short proximal fragment occupies by reason of the intrinsic forces acting upon it. It is also obvious that external pressure such as that exerted by splints, can have very little influence upon the short proximal fragment, surrounded as it is, in the fractures of these bones, by a thick mass of muscle. It is difficult, in fact almost impossible, to overcome angular deformity in these high fractures by splints or plaster casts.

Since it is impossible for us to control the position of the proximal fragment in high fractures, except to a very slight degree, it is necessary to make the distal fragment conform to it. On account of the position of extreme abduction and rotation sometimes occupied by

the proximal fragment it is a practical impossibility in some cases to maintain the distal one in proper position by means of splints alone. Suspension permits us to put the limb in any position we wish and to apply traction in that position. When traction is applied to the distal fragment in a direction corresponding to the axis of the proximal one there is very little tendency to motion between them. In fact, one observes when the proximal fragment is in a position produced alone by the action of the muscles inserted to it, that its position can be changed through a few degrees by a very slight extrinsic force, which force is amply provided by the surrounding muscles when they are stretched by the traction. Conversely, the patient's body may move through several degrees in relation to the proximal fragment without influencing its position when held in this manner. This explans why fixation is so perfect when traction is applied in the proper direction. It also explains the complete freedom from pain observed in suspension with traction. Also, traction strongly immobilizes the distal fragment, especially when applied directly to it, as with the tongs in fractures of the femur, and considerable motion can occur in the articulation distal to the fracture without influencing the relative positions of the fragments. Of course, when traction is applied through the distal articulation, as in skin traction applied to the leg for fractures of the femur, motion at that joint cannot be permitted except to a slight extent up to the time of consolidation.

The methods we have used have been all directed toward obtaining the greatest possible amount of motion in the articulations both proximal and distal to the fracture. We have, therefore, employed counterpoised suspension, allowed the limb to swing freely except in so far as limited by the traction and have applied traction to the distal fragment itself whenever possible. We find, then, that the fractured bone may move freely yet the fragments retain their relative position.

The importance of this freedom of motion in the articulations of the injured limb cannot be overestimated. Not only passive but active motions are encouraged; the circulation is greatly improved; there is no stasis; swelling disappears rapidly; and the period for consolidation is shortened at least 25 per cent. As motion is retained throughout treatment, convalescence is shortened from 50 to 100 per cent. The shortening of the period of disability is so great that it is well worth while to suspend fractures of the humerus rather than treat them with ambulant apparatus.

Relying upon the proper traction in the right direction to produce reduction, we find that operative interference in simple fractures is practically eliminated. The only cases in which we have had to resort to operation have been those in which the bone, having penetrated the muscle, a sling of the latter has prevented reduction. In compound fractures we practice a radical epluchage such as we should have done upon battle casualties if we had had time and proper surroundings. We regret to state that this has not been done in some of the fractures that have come to us late.

Success with the suspension treatment requires a complete set of apparatus which must often be modified to meet special indications. It requires mechanical skill or at least a knowledge of mechanics, a trained corps of assistants, and, of great importance, a portable x-ray apparatus, in order to follow the changes produced by alterations in treatment.

If we may call attention to the faults we have observed in carrying out the treatment, the following seem to be the chief: negligence in regard to the primary principles such as improper traction in the wrong direction and insufficient in amount; not enough use made of skeletal traction (tongs); improper fitting of Thomas splints and non-employment of Pearson's leg piece; lack of care in keeping supporting bands taut, pulleys running easily, and in distributing the weights properly.

As illustrating what has been accomplished in a city hospital service, the following notes on the fractures of the femur and the humerus treated on the Cornell Dvision of Bellevue Hospital for one year, up to three months ago, are appended. All have been seen from three to six months or more after leaving the hospital and therefore the results reported are final. Although the service has not been under continuous direction by one man, all the surgeons have been interested in and familiar with the prin-

eiples of treatment by suspension; and one of us who is not connected with the service can at least express his admiration for the spirit with which the staff has met the difficulties in getting the neeessary equipment.

Many of these cases have been at other institutions before going to Bellevue, thus greatly handicapping the treatment, inasmuch as, as a rule, the early treatment has been improper. Thomas splints are not used for transport in the ambulanees in New York whieh is a disgrace and whieh may lead to suits and reeoveries for malpractice against the eity.

Only one of the eompound fraetures of the femur was properly debrided. Primary union was obtained in this ease and the patient was walking in twelve weeks. All of the others were infeeted, one only slightly but the others severely, one dying.

There were twenty fractures of the femur, five compound and fifteen simple. Two died; one of fat embolism on the eighteenth day (proven by autopsy), the other of infection and secondary hemorrhage. Three were of the upper third, nine of the middle third and eight of the lower third, ineluding the supracondylar.

All were suspended: traction was made with tongs in eight; with adhesive (skin traction) in seven; by pin through tibia in two; and three were plated.

The local results as regards deformity were: six perfect; seven good; one with one-half inch shortening; one with three-quarter inch of shortening; two fair; and one poor.

The functional results were: eleven perfect; six good; and one poor.

If we exclude three eases (one of delayed union of 152 days but with a perfect result; one of 150 days treatment due to infeetion, sequestration and multiple fraetures of other bones; and one of 240 days treatment due to multiple fraeture, general streptococeus infection and exfoliating dermatitis) the average period of treatment in hospital, that is, until they were walking, was 88 days, the shortest being 65 days.

It is diffieult to draw conclusions from the records as to the relative value of tong (skeletal) and adhesive (skin) traction, but our personal convietion is that the skeletal traetion is by far preferable.

Of the plated cases there was one perfect result, one only fair result, and the other was the 240 day ease which was the one poor result of the series. The case having beeome infeeted, the plate had to be removed, tongs being applied afterward.

There were only ten cases of fraeture of the humerus treated in the year up to 3 months ago, for the reason that only the severe and complicated eases of fracture of the humerus are treated in the wards. Of these cases, one was of the anatomieal neek, three of the surgieal neck, two of the upper third, two of the middle third, and one of the lower third.

The results in all were excellent. Briefly they were as follows:

Child 14 years old; fracture of the anatomical neek; union in 42 days. Perfect result on discharge, but on aecount of letting ehild use a sling, some limitation at the shoulder ensued which is improving with treatment.

Man 29 years of age, fracture of surgical neek; union in 29 days; result perfeet.

Man 62 years of age, surgieal neck; union in 21 days; funetion perfeet.

Youth, 19 years of age, surgical neek; union in 29 days; result perfeet.

Man 60 years of age; fracture of upper third, eompound, badly eomminuted; union 4 weeks; perfect result.

Age not stated; upper third; union 4 weeks; result perfect.

Age not stated; middle third; union three; out of apparatus in 4 weeks; result perfect.

Man 70 years of age; compound eomminuted fracture of middle third; union in 31 days; result good.

Age not stated; lower third, discharged on 35th day; funetion perfect.

We may state that the results in fractures of the humerus are eonsistently good even in those fractures entering the joints. As the joints are kept continuously moving, function is always retained and is usually perfect.

PRESIDENT'S ADDRESS*

By A. E. Spalding, M. D.
Luverne, Minn.

Members of the Sioux Valley Medical Association:

It is indeed an honor to be elected to the position of President of this Association, composed of representative men of that portion of the four states comprising it and I wish to thank you.

I know of no society where exists such a feeling of good fellowship and where each member takes upon himself the task of doing his part to make our meetings a success. A Chicago surgeon of note, complimented us by saying that our last meeting was a credit to any society, that the papers were of a high character and that he was only too glad to be present. Article 111, Sec. 2 of our Constitution says, "The President shall deliver an address on some suitable subject at each annual meeting.

Whether my subject is a suitable one or not I will leave to your judgment, for I shall deviate from the usual custom of stating our progress, and saying many things of a pleasing nature, but bring before you some of the unpleasant features that confront us in our aim to benefit mankind, brought before us by the dear people whom we have endeavored to protect in regard to medical laws and sanitation.

The medical graduate of today is expected to have at least two years of collegiate work and four years in a class A medical school.

The young graduate after receiving his degree and passing the medical board of the state in which he desires to practice, launches out imbued with the idea that his qualifications will be respected, but after a few years experience he finds that the various cults, whose qualifications are absolutely nil are occupying positions of trust, and he asks himself, the question "Am I such a great man after all."

For his enlightenment he takes Bulletin No. 4 of the Carnegie Foundation and learns the following. That they appropriated money and authorized a study and report upon schools of medicine in the United States, one hundred and fifty in all. In making this study, all medical sects were included, for as long as a man is to practice medicine, the public is equally concerned in his right preparation for that profession whatever he calls himself. That he should be grounded in the fundamental sciences upon which medicine rests whether he practices under one name or another. The report states that the eight Osteopathic schools fairly reek with commercialism. Their catalogues are a mass of hysterical exaggerations, alike of the earning and of the curative power of osteopathy. They state, "In no case has a competent osteopath made a failure in his attempt to build up a paying practice." "His remuneration, counted in dollars will be greatly in excess of what he could reasonably expect in most other lines of professional work." "It is only fair to say that many of our graduates are earning as much in single months as they were formerly able to earn by a full years work." "The average osteopath has a better practice than ninety out of every hundred medical practitioners."

This Carnegie report says, "While they pretend to have laboratories and teach physiology, pathology, chemistry and microscopy, let it be stated therefore with all possible emphasis that no one of the eight schools is in a position to give such training." "That the Still college at Des Moines has in place of laboratories, laboratory signs." "The Kansas City school had one cadaver early in the fall and was looking ahead for a second one the latter part of the winter."

After this information is it any wonder that the young Physician asks "Why are these cults legalized and placed upon equal footing with the man who has given six years of his time to obtain the best education possible to practice his profession?"

The City of Pipestone until a few months ago had a Chiropractic doctor as their health officer. The City of Luverne at the present time has an osteopath, appointed by the wise members of the respective Councilmen. The Judge of Probate of my county invariably appoints an osteopath on the board of three physicians to examine suspected insanity cases.

Death certificates are signed by these men. Now what do you think of the value of our

*Presented at the Twenty-Fifth Annual Session of the Sioux Valley Medical Association, Sioux Falls, S. D., June, 1920.

vital statistics in which the Government seems to be so eager to have all causes of death absolutely shown?

Several years ago we had an epidemic of scarlet fever in our city. Most of the cases were mild, but I reported all cases to the health officer who was an irregular physician and not a graduate, but legalized. The red card was placed upon houses that I reported, but he took particular pains to inform the people that he was required to quarantine them as I had reported it but he knew that it was not scarlet fever. After three deaths had occurred and public funerals permitted in the cases he had treated, I reported him to the State Board. The local health officers reply to a letter from the State Secretary was, that we had no scarlet fever. I naturally became indignant and asked the City Council for the privilege of sending for a physician to investigate and Dr. Sullivan was sent for. His examination showed that one of the deaths was reported as being caused by dropsy, another as inflammation of the brain, the other after discharging ears and profound coma as abscess of the brain. All cases had desquamated. Children were attending school while desquamation was in progress. Our Senator, a man who was supposed to help make our laws, said that his children had the same disease but he called the health officer because he did not want to be quarantined.

One member of the Council said, "What did you accomplish by this investigation? You lost out and the health officer got all of the business."

True, but I felt that I had done my duty which was worth more to me than the paltry dollar. I hope you will pardon me for taking your time in bringing before you my personal experiences but they will illustrate the point I wish to make, that the people seem to be antagonistic to us in our efforts for their protection.

I recall the time when two cancer doctors opened an office at Worthington, Minn. and were doing an extensive business. The local doctors held a meeting and decided that as they were not licensed, they should be prosecuted. They were brought to trial with the result that they were acquitted.

The local papers came out with big head-lines criticising the local doctors and expressing themselves as being delighted at the outcome of the trial. The late Dr. Anderson of Estherville, Iowa had these same men arrested with the same result. The public press is not with us. A two column write up of a wonderful doctor who was to be at our hotel for three days was the means of causing one of our citizens to seek relief of this quack. He was in the last stages of pulmonary tuberculosis. His widow informed me two weeks after this visit that she paid him one hundred dollars for his services. I related this to our editor who was also our senator (not the one previously mentioned), and asked why he aided such quacks in their dishonest work by giving them space in his paper. His reply was that he was well paid for it. And this is the attitude of the men who make our laws, and of the press. The public press seems eager to give a prominent place in their papers to anything which criticises the regular profession.

A Sioux Falls paper of the date of Jan. 31st, 1920 devoted a whole column, the aim of which was to show that medicine in our late war was a total failure. It quoted from an address delivered by Charles Saloman under the auspices of the New York Anti-vivisection Society as follows: "Our reorganized army number at least 3,000,000 men, and with the navy and marine corps and national guard we will have 750,000 men in our defensive forces. Each is a potential victim of present day medical practices." "It is not for him to decide whether he will be innoculated with deleterious disease products." He further says, "It not only failed to prevent disease (witness the more than 3,000,000 admissions to the sick report), but the practice it is directly responsible for, the alleged prophylactic inoculations must logically be credited with a large part of such disease."

The February 22nd issue of this same Sioux Falls daily, not satisfied with its former publication of these lies and misrepresentations comes out again with head lines saying, "Medical Record In World War Poor." "Salamon Declares Failure of Medicine Was More Complete Than Previous Wars" and gives another column to this trash.

You men who went through the service know

full well that the scourge of typhoid fever of the Spanish American war was not repeated in this great war, and that it was due to better sanitation and the very inoculations that this man decries. You men and those at the head of the army medical service should receive great credit for your wonderful work instead of having false representations heralded before the people by our public press.

The Journal of the A. M. A. publishes in its columns analyses of the various quack medicines that gull the public. You well remember their article exposing Wine of Cardui. The wealthy corporation back of this fraud brought suit against the A. M. A. and after weeks of time spent in the trial and an expenditure of thousands of dollars, the jury gave this corporation a verdict of one dollar, throwing the costs on the A. M. A. after overwhelming evidence which showed that this decoction was used especially in the South as a beverage on account of its large percentage of alcohol and that its medical properties were nil. This another example of the dear peoples appreciation of our efforts for their benefit.

A few years ago while attending the Mayo Clinic I met the Secretary of the State Board of Health of Wisconsin who had accompanied Senator La Follette to the clinic for an operation for gall-stones. After the operation and during a conversation with this doctor, I remarked about the throngs of people who came there for treatment, that the clinic was founded upon the best that is known in medicine and surgery and was deserving of its great patronage. I also remarked that he had in his State a quack institution known as he Till Institute which as far as numbers are concerned is equally well patronized. "True", he remarked, "I was called to the northern part of the State where he practices and when I arrived the crowds present led me to believe that Ringling's Circus was in town." This plaster quack has been arrested many times but always acquitted. He still flourishes like a green bay-tree.

One of the most damnable, criminal acts sanctioned by a certain class of people came to my notice when a young man while drawing a loaded shot-gun from a wagon, received the charge in his right arm nearly severing the member from his body. Two of our physicians were summoned by neighbors but upon their arrival found the Christian Science reader in attendance. The brachial artery was spurting his life blood away but the fanatics absolutely forbid the doctors from tieing the artery or rendering service which might have saved his life. These poor misguided people were undoubtedly following Mary Baker Eddy's instructions as found in her book, page 375 which says, "Therefore the efficient remedy is to destroy the patients unfortunate belief, by both silently and audibly arguing the opposite facts in regard to harmonious being—representing man as healthful instead of diseased, and showing that it is impossible for matter to suffer, to feel pain or heat, to be thirsty or sick."

When we take into consideration the fact that all progress in the line of preventive medicine including the discoveries of diphtheria antitoxin, typhoid vaccine, and the fact that the mosquito serves as an intermediate host for the parasite of yellow fever as well as malaria, were made by the regular profession, we ask ourselves, what have these various cults done that they should be recognized and legalized by so many states. They antagonize every move of regular medicine. The great work of the Red Cross is combated. In my city the committee for the sale of red-cross stamps enclosed two dollars worth in a letter of appeal to our business men. The only refusals to aid in this work came from a chiropractic doctor who wrote an illiterate letter when he returned the stamps, in which he said that their system had cured more cases of influenza during the past epidemic than regular medicine, and that the red cross was a scheme of the A. M. A. The other refusal was from a christian scientist.

The question of medical legislation I think is one of the most discouraging propositions our profession has to deal with; any bill fathered by us, is looked upon with suspicion. Bills already passed which were made for the purpose of protection of the people are fought at nearly every session of the legislature. I will quote from a pamphlet entitled "The Minnesota Legislature of 1919" which states that the book is published, not for profit, but

to inform the voters as to the record of Senators and Representatives. On its front page it says, "read and pass to your neighbors." Then under the head of Medical Matters, it says, "For many years the Chiropractors have been asking to be permitted to practice their profession on the same terms as other schools of healing. For a long time the Allopaths were the only doctors who had the legal right to practice, but the osteopaths and chiropractics were still outside the pale and were prosecuted, arrested and imprisoned for the "crime" of healing the sick "without a license." "Later the osteopaths proved that their methods cured far more patients than the regulars did and the doors were opened to them, and now the chiropractors have gained full legal rights, they are no longer 'criminals' when they heal the sick and cure the halt and lame." March 6th the bill passed the Senate with only two votes against it and the House February 10th with only one vote against it. Then came a bill to establish a County Board of Health. The bill aroused intense and wide-spread opposition. To quote from this pamphlet previously mentioned it says, "The Christian Scientists, the Osteopaths and all others outside the regulars filled the House Chamber and the galleries at a public hearing to enter protest." The bill was killed in Committee. "Thus ended the attempt of what was called the inner ring of the A. M. A. to foist its iron clad monopoly on the people of Minnesota." "The people must be constantly on the alert against the attempts of that ring of medical politicians to establish a tyrannical medical autocracy as bad as anything the Kaiser had ever put over."

What was known as the Rodenberg bill, to prohibit compulsory medical examinations and treatment including dental and surgical without personal consent of parents or guardians, came up. This was a drive at our school protection. This bill passed the House by a large majority but died on the Senate calender.

Now, what should be our attitude regarding Medical Legislation? Most States have a committee on Public Policy and Legislation. Minnesota last year had such a committee but did not act. Their reasons for so doing can better be shown by quoting from a letter written by Dr. J. C. Litzenberg, the President of the Hennepin County Medical Society, in reply to a letter he received from one of the Senators. It is as follows:

"Hon. Jas. Handlan, Chairman.

"Dear Sir:—I beg leave to acknowledge receipt of yours of recent date in regard to the bill relating to compulsory physical examinations by health authorities. The time is too short to call the Hennepin County Medical Society together for a formal expression, so the views here expressed are my personal opinions, but from interviews with many physicians I believe I voice the view of a large percentage of the profession. I note that you say that 'The advocates of the bill have been pushing it aggressively, but the medical profession was not represented at the hearing in either House.' Why? In your request for our opinion you say, 'This is a bill in which the medical profession should be interested, and I would like to know the views of the doctors upon it.'

"There may be others who have been surprised that the physicians have done no lobbying against this measure. Please permit me to explain that the medical profession is taking a new attitude toward all health legislation, namely, that the public health is the concern of the whole people and not of any single profession or class. We take the position that as medical men we will not lobby or use political methods to further any public health bill, believing that the responsibility for the health of the people rests directly upon the shoulders of the people themselves through your honorable body and not upon the medical profession except in the capacity of advisors and then only when desired by you.

"It has for years been customary for physicians to use their utmost efforts to advance the cause of public health legislation, even though it is perfectly manifest that fewer physicians are needed as the public health is improved. Therefore, it is evident that efforts of the medical profession were only for the good of public health.

"In spite of this, ulterior motives were attributed to us. However, we care very little about the misinterpretation of our motives, but a really serious situation has arisen on ac-

count of the belief that such bills were in the interests of the medical profession alone and that, insofar as they affected the public health, the medical profession would protect the interests of the people. The public itself has taken practically no interest or responsibility in the matter of its own health while the medical profession has received only criticism in its efforts to protect the public. Therefore, we have determined to place the responsibility where it belongs, upon the shoulders of the public whose health is at stake. We will take no part in lobbying or solicitation of individual legislators, but we will place ourselves at your service when desired; if not desired, your responsibility is to the people, not to us. But inasmuch as you have by letter asked our opinion of the measure before you, we feel in duty bound to answer your query.

"The passage of this bill will increase the income of physicians, but will be a grave menace to the health of the public; your children and the families of your constituents will be exposed to contagion by the exemption of certain individuals from the authority of the health officials. Epidemics may be expected. One individual exempted from control, may give a contagious disease to hundreds; one diphtheria or typhoid carrier has been known to distribute these diseases to whole communities. This bill is not in the interest of the great public good, but for the benefit of a few individuals. Sometimes the desire or even the rights of individuals must be subordinated to the public welfare. The responsibility is yours, gentlemen. The medical profession has performed its full duty in pointing out the danger to the public health. Whatever action your honorable body takes will be with the full knowledge of the consequences. The responsibility for protecting the public from disease and bettering health conditions belongs to the people, through you. The true function of the medical profession is to advise the people and to show them how to protect themselves. The doctors mission is to be a teacher and not a political manipulator or lobbyist.

"The principles here expressed are fundamental, and the sooner they are recognized the better it will be for the health of the people."

This letter was adopted as the census of opinion of the committee on Public Policy and Legislation of the Minnesota State Medical Association as was also a recommendation of President Head that the incoming president appoint a committee to whom the Legislators could refer.

This, Gentlemen, is the stand I think we should take. Let the people come to us. Only when they have seen the folly of their ways will they wake up to the situation that we are their friends and not the various cults whose only aim is to gull the people.

THE RELATION OF CHRONIC GAS POISONING (WARFARE) OF THE LUNGS TO PULMONARY TUBERCULOSIS*

By Frank W. Spicer, A. B., M. D.
Duluth, Minn.

Since the close of the World War, many valuable summaries of intense studies, in all branches of medicine and surgery have been presented to the medical profession. There have been studies of all phases of tuberculosis, beginning with the examination of the recruits and the relation of various diseases to tuberculosis, especially of influenza as a factor in the reactivation of quiescent and healed pulmonary tuberculosis.

There is today a new pathological condition as a result of the war, demanding careful study—namely—gas poisoning and its effects. And a most important phase—the relation of chronic gas poisoning (warfare) of the lungs to pulmonary tuberculosis—is the subject of this paper today.

The United States has had practically only two years experience with these cases. Five or ten years from now we will know more about the effects of gas poisoning.

J. H. Elliot, Lt. Col. C., A. M. C. Toronto in an article in the American Review of Tuberculosis, early in 1919, says:

"The symptoms of gas poisoning are varied. Those referable more particularly to the respiratory system are cough, pain or oppres-

*Read before the Mississippi Valley Conference on Tuberculosis, Sept. 3, 1920, Duluth, Minn.

son in the chest on exertion and dyspnea on slight exertion, particularly when walking on any incline. In the presence of slight apical changes or old standing asymmetries of the chest, tuberculosis is often suspected. It was generally anticipated that the chemical damage to the bronchial mucous membrane and the resultant inflammation would result in the aggravation of any latent tuberculosis. This, however, has not been the case. Although a large number of men in certain sectors have been again and again exposed to gas in varying quantities, we find amongst our cases of tuberculosis very few who have become casualties through being gassed.

In 1000 French soldiers suspected of tuberculosis, Kindberg and Delhirm found one or two in which the gas bore relation to the onset of their illness. Other French authors report only three cases among 206 soldiers suffering from tuberculosis. Stewart of Ninette says, "Gas poisoning is most horrible and most deadly in its effects, but pulmonary tuberculosis is not one of these effects. In more than 300 soldiers admitted to the Manitoba Sanatorium for treatment, of whom many had been more or less gassed, in no case did this seem to be in any measure responsible for the disease. In two or three in whom after effects of gas were marked, tuberculosis could not be diagnosed."

J. H. Miller in late 1919 in the American Review of Tuberculosis says:

"Another interesting medical question which affects all the armies is the effect of gas warfare and of chest wounds upon the subsequent development of pulmonary tuberculosis. It appears to be definitely proved that, contrary to expectations based upon currently accepted notions, pulmonary tuberculosis does not often develop as a result of these severe mechanical irritations of the respiratory tract.

"The infrequent development of pulmonary tuberculosis as the result of exposure to poisonous and irritating gases and of chest wounds raises the question as to whether we have not in the past over-emphasized the dangers of mechanical irritation and trauma as exciting causes of active tuberculosis."

These earlier reports will probably need to be revised. While as yet absolutely final statements can not be made, still some definite ones can be.

Many difficulties were encountered in the examination of the recruits. For patriotic reasons, many concealed their symptoms; for less patriotic reasons others concealed theirs; perhaps the slacker exaggerated his. There was also difficulty in examining the soldier who wanted to "go across". For fear of being left behind, he would belittle his ailments. But the overseas examinations were very severe, and few mistakes were made. At the present time it is often a battle of wits between the examining physician and the ex-service man. At the time of their discharge, especially the overseas causalties, thousands begged their immediate discharge and resented being held over for any period. Who could really blame them? They would voluntarily offer to sign anything to get out of the army, even though they were entitled to compensation. They wanted to go home at once. There was often a great discrepancy between their statements and their physical condition. Today it is another story —they are out and the Government is righting things and is fair to those who deserve.

The cases studied were those seen:

First, while on duty in the United States General Hospital No. 21 (Tuberculosis) Denver. Many of the gassed cases, after spending various periods in hospitals in Europe, were transferred to the United States. Many were sent with the diagnosis "Gassed, Observation, Tuberculosis" to the various tuberculosis hospitals where they were kept for observation.

Second, as Medical Consultant U. S. P. H. S. Duluth. The men who are getting compensation report periodically for examination to note any change in their condition. And those claiming compensation report as directed—many reporting daily for the first time. These men have not previously been observed and consequently are not included in any previous records. They are reporting for examination, many of them, because they are fearful that they are developing tuberculosis.

The cases for this report were men whose ages were from 18 to 40 years. Men who were physically fit. Men who had not had the "Flu," Pneumonia, Typhoid or any of the acute exanthemata and whose past medical history was

negative. They were sent to the hospital for study when necessary.

Briefly, a word in regard to the various kinds of gasses used, and their effects. They were principally, (1) Mustard gas, (2) Phosgene, (3) the Chlorine gasses. It is said that there is an individual susceptibility to mustard gas. These gasses produced primarily congestion, edema, ulceration and later secondary infection on the skin and on all the mucous membranes with which it came in contact. On the skin anything from a mild erythema to sloughing; in the eyes, conjunctives, corneal ulcers and even a panophthalmitis; in the larynx, congestion, edema, ulceration and infection, causing a loss of voice, usually temporary, or hoarseness, often permanent; also lesions of the gastro-intestinal tract. This is not generally appreciated. I have at present two cases of gas poisoning on whom a cholecystectomy and an appendectomy has been done, for the relief of their symptoms. Of course neither case was benefited, and their symptoms were only aggravated on account of the ether anesthetic. The greatest damage is done to the respiratory tract. There is produced primarily, congestion, edema and ulceration of the bronchial mucous membrane and the inflammation spreads to the surrounding tissue, the parenchyma and the supporting framework of the lung. Sloughing and hemorrhages may occur. If the gassing has not been severe enough to cause death by asphyxiation and cardiac failure, nature begins to repair and scar tissue is formed. This condition makes a very fertile field for the growth of the tubercle bacilli and the gas as a poisonous product breaks down immunity in a sufficient degree to allow the lighting up of any old foci that might have been present. This includes old abortive lesions of Bard; quiescent lesions of larger size and even peribronchial glands. Who has not had some tuberculous infection? Possibly some few of the fortunate ten per cent. But with this condition present and extending over a period of years, the writer can seen no reason why a new tuberculous infection could not be implanted in any of the unaffected ten per cent just as well as a reactivation to occur in any of the infected ninety per cent. A good stero (X Ray) picture would seem to bear out this statement.

The acute symptoms depend upon the severity of the gas poisoning. The symptoms as given by the patients are : (1) burns of the skin; (2) eyes, sore, watery, red, swollen shut, or blinded; (3) nose and throat sore; (4) inability to talk or whisper for various periods; (5) shortness of breath; (6) pains in various parts of the chest, and over the heart; (7) cough at once or after a few days—maybe bloody sputum; (8) suffocation; (9) intense abdominal pain with severe diarrhea; (10) unconsciousness from a few hours to a number of days and in hospitals for various periods or under treatment from a few weeks to two years.

The chronic symptoms do not always depend upon the severity of the gas poisoning. The symptoms in chronic cases in order of their frequency are as follows; shortness of breath, especially upon slight exertion or paroxysmal in character, weakness and early fatigue; cough, with or without expectoration, may be paroxysmal, occurs at various times during the day or night, in the morning, or when in close places or upon inhaling dust. Pain in various parts of the chest, nausea and vomiting, poor appetite, pain after meals, constipation or diarrhea, loss of weight, hoarseness which may be intermittent, tachycardia which may be paroxysmal, easily irritated eyes, tendency to catch cold easily, prefuse perspiration and pleurisy, all appear among the complaints.

There are differences between the pathological chest due to gas poisoning and the pathological chest due to tuberculosis, although a very careful study must be made to find those differences in many cases. Some cases of mild gas poisoning will give marked symptoms, not unlike incipient tuberculosis. Only after a long and careful study can we be reasonably sure of the correct diagnosis. The writer has recently diagnosed a number of cases of tuberculosis two years after the gassing. These individuals have been examined at various times in the past two years, and heretofore a diagnosis of tuberculosis had not been made. This shows the lethal effect of the gas and it shows that it has taken two years for the old lesion to become reactivated or a new infection to become implanted.

The physical examination of moderately

severe cases of gas poisoning will reveal the following: (1) inspection will show diminished expansion, rarely of the entire chest, most frequently of the bases, one or both, more often the right, less frequently the upper regions; (2) tactile fremitus may be increased; there may be depressions above and below the clavicles; the respiration is shallow; (3) there may be impaired resonance; percussion may be normal or even hyper-resonant in some cases reminding one of the emphysema of asthma; (4) inspiration is rough, harsh, and sometimes of the cogwheel type, slightly intense and heard over the entire chest better than normally, providing there is no pleural thickening. In some, expiration is prolonged. Over the bronchial areas themselves the breathing is almost tubular in quality. The rales are scattered but more prominent in the middle of the chest, not in the extreme apices or bases. They are all shapes and sizes, come and go, and usually clear up on coughing. They are not the true subcrepitant or indeterminate rale, and of course are never resonating. When the patient expires, coughs and inspires, the rales do not come at the beginning of inspiration as the tuberculosis rale does, but later in and extend through inspiration. They resemble the sibilant and sonorous rale. They are musical and not the sticky or cracking rale of tuberculosis.

The underlying pathology explains the physical findings. There is a true inflammation of the bronchi, with some old peri-bronchial induration that is contracting the bronchus from the outside and more or less infiltrating the interstitial tissue of the lung. This explains the shallow respiration, the increased tactile fremitus and the harsh breath sounds. Coupled with this is the turgescence of the mucous membrane that produces the expectoration and musical rales. It is the smaller bronchi and bronchioles that are most affected, so that the rales are smaller than if the larger bronchi were affected. The pulse is usually rapid—80 to 100. Blood pressure is normal or lowered. If these patients are given the exercise test their dyspnea increases, the pulse becomes rapid and it is slow in returning to normal. There may be myocardial weakness and murmurs may be brought out.

Fluoroscopically not much can be learned except in regard to the diaphragm, but good stero plates are valuable to check up the physical findings. The plates show disseminated evidence of inflammation; the "shadowed" bronchi and vessels with the haziness more or less pronounced extending far out into the lung substance; not the massive involvement of all lung tissue as is seen in an active caseous or fibro-caseous tuberculosis. However, to always diagnose correctly between some of the various pictures of tuberculosis in its various stages of activity and chronicity and the arrested cases and the various grades of gas poisoning is sometimes difficult.

The differential diagnosis between pulmonary tuberculosis and chronic gas poisoning, of the lungs is often extremely difficult. A difficult problem arises in cases which give a history of paroxysmal symptoms and in which some of the physical findings are "shifting" and intermittent as Smithies terms it. To illustrate: L. B. Aged 21, gassed May, 1918—thought it did not amount to anything and crawled into a hole and went to sleep. When he awakened he could not talk. Eyes were swollen shut, had severe abdominal pains and vomited, was in the hospital from May until August, 1918, when he was discharged to duty. He has had paroxysmal attacks of pain, dyspnea, dizziness and cough since that time. He was discharged from the army in April, 1919 without compensation. My first examination of him seemed apparently negative except for slightly diminished expansion of the right base. A second examination was practically the same, but he complained of these attacks about once a week. He was put in the hospital and was observed during an attack when a picture of gas poisoning was found. Smithies says: "This condition is not unlike that holding in individuals affected with frequent asthmatic paroxysms—between the paroxysms lung examination may reveal no cardio—respiratory upset, and yet in the attack both pulmonary and circulatory embarrassment are evident and incapacitating."

In conclusion let me say that while in Denver I saw many gassed cases uncomplicated by the tubercle bacillus that were rapidly fatal; also many severe types of tuberculosis whose symptoms dated from the day they were gassed. Today, two years from the time the men were

gassed, I see cases in which the symptoms are slowly disappearing, cases which are stationary and cases in which a diagnosis of tuberculosis is being made for the first time. While it has been a prevalent opinion that gas has not been an etiologic factor in the causation of tuberculosis, I believe, and basing my belief on observation in the past two years, that as time goes on we shall find more and more of these cases of tuberculosis in which we can definitely prove an etiologic factor of gas, and I believe that gas poisoning in the lungs produces terribly severe and lasting effects, and that pulmonary tuberculosis is one of these effects.

THE SURGICAL TREATMENT OF CEREBRAL HEMORRHAGE IN THE NEW BORN*

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Cerebral hemorrhage is the cause of death in over 50 per cent of the infants still born or dying within the first week of life at the University Hospital.* Its frequent occurrence without death is attested to by the thousands of cases of mental deficiency, spastic palsies, epilepsy, blindness, and varying degrees of amentia. The early recognition and the prompt institution of appropriate treatment will prevent many of these deaths and much more important, avoid the sad sequels of cerebral hemorrhage.

The etiology of cerebral hemorrhage of the newborn is complex. Incident to the trauma of parturition, the molding of the head, the overlapping of the parietal bones, or the occipitals under the parietals, the blood vessels of the brain may be torn. Excessive trauma may even cause laceration of the large veins and sinuses, with prompt death. Spontaneous rupture of the delicate vessels may occur in the cerebral congestion of asphyxia neonatorum. Cerebral hemorrhage occurs as frequently in normal, precipitate, and even pre-mature births as after stormy labors. Cerebral blood clots have been found before birth. Hence there are causative factors to be considered other than those of trauma. The majority of cases are caused by a combination of the normal trauma incident to childbirth and a phase of the so-called hemorrhagic diseases of the newborn. Rodda* in his work on the coagulation and bleeding times of blood in the newborn has shown that "there is a prolongation of coagulation and bleeding times from the first to a maximum on the fifth day of life with a return to the average first day determination time before the tenth day. It is significant that this coincides with the age incidence of hemorrhagic disease and cerebral hemorrhage." This normal prolongation of the coagulation and bleeding times makes it difficult for nature to control the hemorrhage incident to the traumatic rupture of the delicate cortical vessels. The blood clot in the vessel is soft and easily disturbed. When the coagulation and bleeding times are abnormally and greatly prolonged as in the condition of hemorrhagic disease of the newborn, the oozing or bleeding continues, and continues causing increased intracranial pressure, convulsions, and death. If the infant survives, the after results of the increased intracranial pressure and cerebral degeneration manifest themselves promptly, or slowly in the course of months.

The hemorrhage may be supratentorial, infratentorial, or intraventricular, the blood coming from the longitudinal sinus or its tributary system, the transverse sinus, or the vessels leading to it, or the choroid plexus respectively. It may come from a torn tentorium. The hemorrhage is most commonly cerebral and unilateral, the blood coming from the delicate cortical vessels. The blood may clot or remain fluid. Among eighteen autopsies upon cases of cerebral hemorrhage at the University Hospital by Dr. Warwick, there was no instance of gross hemorrhage into the brain substance.

Symptoms: The history of the births, while important, in the majority of the cases

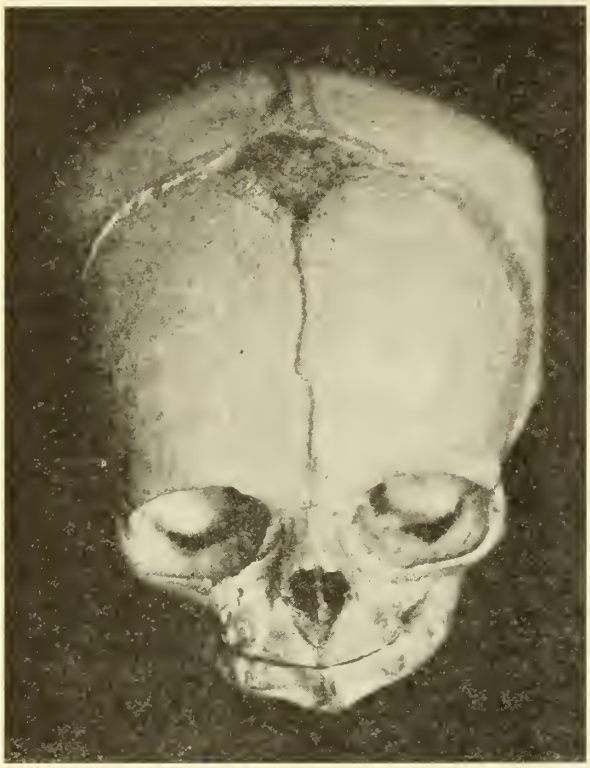
*Read before the Minnesota State Medical Meeting, St. Paul, October, 1920.

*Warwick, M., Cerebral Hemorrhage of Newborn. Am. Jour. Med. Sc., July, 1919, vol. 158, p. 95.

*Rodda, F. C., Studies with a new method for determining the coagulation time of blood in the newborn. Am. Jour. Dis. of Child., Vol. 19, p. 269.

*Brady, J. M., Lumbar puncture in meningeal hemorrhage of the newborn. Jour. A. M. A., June, 1918, p. 347.

*Cushing, H., Concerning surgical intervention for the intracranial hemorrhage of the newborn. Am. Jour. Med. Sc., Oct,. 1905, vol. 30, p. 563.



No. 1. Photograph of infant skull. Note broad sutures and fontanelle, which latter may be termed Nature's prophylactic decompression; sufficient, however, for only the mildest degrees of increased intracranial pressure, beyond which operative decompression must be performed.

are of normal and non-instrumental deliveries. The birth may even be precipitate. Various degrees of asphyxia neonatorum and delayed spontaneous respiration are common. The respiration when established is frequently slow, shallow, and irregular. The pulse is slow in the moderate degrees of compression, rapid, when medullary paralysis is imminent. Inequalities of the pupils and ocular palsies may be present. Hyperactivity of the reflexes, the child starting and twitching in response to mild or normal stimuli with the development of spasticities and focal or general convulsions are characteristic. Examination of the fontanelle may disclose a distention, a tenseness at times of board-like degree or actual bulging, with loss of pulsation. The sutures may be separated and the veins of the eye lids and forehead prominent and dilated. The infant may be languid, apathetic and have difficulty in swallowing. Disinclination or inability to suckle is common. The delivery may be normal or stormy and a slow cerebral hemorrhage be present, not manifesting itself until after several days with the gradual development of cerebral compression. The symptoms may be mild with perhaps a convulsion or two, and the child seemingly spontaneously recover. Later observation discloses the lack of mental development, the spasticities, deafness, and blindness, or epilepsy may develop from adhesions, scar, cysts, and so forth, depending upon the location and extent of the hemorrhages.

The coagulation time of the blood and bleeding time will be found prolonged in the majority of the cases. This information is most important, and with Rodda's simple method should become a routine estimation in the newborn. When both times are greatly prolonged, hemorrhage can be anticipated and prophylactic injections of blood made or transfusion be performed. The hemorrhagic tendency should be controlled, and evidence of hemorrhage most suspiciously watched for.

No. 2. Case of cerebral hemorrhage; baby boy S. Note marked spastic contracture of right arm and hand, also feet. Craniotomy done third day after birth; removal of blood clot overlying left motor region. Child reported seemingly normal at 15 months of age.

No. 3. Case of cerebral hemorrhage; baby girl H. Craniotomy done fifth day after birth, over left motor cortex. Photograph of child six weeks after craniotomy. Patient reported seemingly normal by pediatrician eleven months after operation.

A spinal puncture is to be performed, and spinal manometer readings may be made. In the infratentorial hemorrhage, blood under various degrees of pressure may be obtained. In the supratentorial cases microscopic blood may be present in the spinal fluid, but the finding is not reliable. Zanthochromia should be tested for and when positive points to hemorrhage, about the base of brain or upper cord region.

Treatment: Prolonged coagulation and bleeding times call for the injection or transfusion of blood. Repetition is guided by the blood findings. In the slow bleeding cases this treatment may be preventive and suffice. The shortening of the coagulation and bleeding time in severe hemorrhages is absolutely essential to successful surgical intervention.

In the infratentorial cases spinal puncture or punctures may be performed.* As much as 60-80 c.c. of blood may be removed at a time, the tenseness of the fontanella subsides and prompt relief of symptoms is obtained.

Craniotomy should be promptly performed upon the cases of supratentorial hemorrhage. This may consist of a decompressive operation or an osteoplastic craniotomy with the removal of the blood. In view of the fact that the hemorrhage is on the surface of the brain and not into its substance, a simple decompressive craniotomy without disturbance of the clot may at times suffice, or in very grave cases be performed preliminary to a later operation for the removal of the blood.

The delicate brain tissue of the infant illy withstands the effect of pressure. This is eloquently borne witness to by the many cases of Little's disease, the various degrees of amentia, and autopsy statistics, the compression anemia preventing normal medullation and development.* The architecture of the infant's skull is planned to relieve a certain degree of increased intracranial pressure, being partially distensible by means of the broad sutures and the fontanelles, which latter may be termed Nature's prophylactic decompressions. This provision, however, suffices for only the mildest degrees of increased pressure beyond which operative decompression must be performed to prevent the degeneration of the brain or the impending medullary paralysis in the more severe hemorrhages.

In the presence of focal symptoms, the site of the craniotomy can be anatomically determined. In the absence of such localizing data a single or double subtemporal decompression may be performed.

To locate the side of the hemorrhage, I wish to present the following procedure: Through a one inch muscle-separating exposure through the temporal muscle a small button is removed from the parietal bone. If the blood cannot be seen through the dura a ⅛ inch or ¼ inch incision through the exposed dura will suffice to ascertain the presence or absence of blood. If present an osteoplastic craniotomy may be performed. If negative, a second trephine exploration may be performed upon the opposite side.

The surgical treatment for cerebral hemorrhage should be instituted early, preferably during the first weeks of life. Operations for the late sequellae are rarely indicated. Cranial surgery, under proper auspices is well tolerated by the new born infant. These new arrivals are mostly spinal organisms and the traumatism of a properly performed operation to the brain is not much greater than of the average child birth. The underlying brain is the important consideration and the traumatism is practically all limited to the thin skull and scalp and then in a direction away from the brain. The infant should be warmly wrapped during the operation and the temperature of the operating room be preferably around 80°F. Ether is administered and the operation performed with scrupulous attention to hemostasis. Hemorrhage is synonymous with shock and infants do not tolerate excessive loss of blood. The clot, when exposed, is carefully removed with a spatula, cotton-wound applicators and by gentle irrigation with normal saline solution. Of four craniotomies for cerebral hemorrhage in infants performed upon, the second, fourth, fifth and seventh days of life respectively, there were no operative deaths.

One child died eight weeks after the operation. The hemorrhage in this case was probably intraventricular. An autopsy could not be obtained. The remaining three obtained prompt relief and are reported seemingly normal by their attending pediatricians.

CONCLUSIONS

1. Untreated cerebral hemorrhage of infancy is responsible for 50 per cent of the still births and deaths of infants within the first week of life.
2. The morbidity is worse than the mortality.
3. The coagulation and bleeding time estimation should become a routine procedure in the new born, followed by the injection and transfusion of blood when indicated.
4. Infratentorial hemorrhage of infancy may be treated by lumbar puncture.
5. Supratentorial hemorrhage requires prompt performance of a decompressive or osteoplastic craniotomy.

DISCUSSION

DR. F. C. RODDA, Minneapolis: Dr. Strachauer has very well described the etiology and symptomatology of cerebral hemorrhage. I wish to say one thing about surgery in this condition, it must not be promiscuous. In surgery, for the relief of cerebral hemorrhage as in other conditions, there are certain indications and contraindications. A very important contraindication will be hemorrhagic disease unless the tendency to bleeding is controlled by blood injections. Again, the results of surgery will vary according to the site and extent of the hemorrhage. We have repeatedly found, at autopsy, many ounces of blood remaining in the posterior fossa after the removal of the brain. A decompression in such instances would not afford complete relief.

The ideal case for operation is one in which the blood findings are normal, in which we have spasticity of an arm or foot or perhaps involving one side of the body, or other localizing symptoms, and in which we can make a fair sort of opening down over the blood clot.

I believe more work should be done in this field. An attempt to give relief even if the patient dies on the operating table should not discourage the surgeon provided his indications for operation are clear cut. Death is preferable to a life of idiocy.

Of the cases in which Dr. Strachauer has done a decompression, we have followed several. Two such cases, I have examined recently. They are now one year and fourteen months of age respectively, and show normal development, physically and mentally.

DR. MARGARET WARWICK, Minneapolis: I do not think I can add very much to Dr. Strachauer's discussion as he has taken it up very fully and covered all the points. I would like to point to the fact that routine autopsies on children dying at birth or in the first year of life has added a great deal to this study. It was about 30 years ago that

careful routine autopsies revealed the fact that Little's disease was caused by hemorrhage of the brain. So far as we are concerned at the University Hospital, we feel that these autoposies have added a great deal to our knowledge. The autopsies on these infants are usually fairly easy to obtain. Our Department of Pediatrics has obtained about 100 per cent and so we were able to study very carefully the exact location of the hemorrhage and the relation it might have had to any symptoms. We found in our series that 50 per cent showed cerebral hemorrhage and in no case could we lay it to the trauma of labor. When the relation between Little's disease and cerebral hemorrhage was established, it was thought to be due to forceps delivery or difficult labor, but in our series we found this not to be true at all. On the other hand, we found that most of our cases occurred after preciptate or normal deliveries. Cushing has pointed out that in infancy as in fetal life there are no adhesions between the dura and the brain and that most of the vessels come directly off the brain to the inner surface of the cranium, are not protected, and so are very easily torn. We can realize that if we have a very rapid overlapping of the bones and moulding of the head we may have hemorrhage, while if the moulding has been slow, the vessels can gradually adjust themselves to the changed position without injury. We also found in these cases that many showed hemorrhages in other organs, leading to the conclusion that hemorrhagic disease of the new-born was responsible and not only overlapping of the parietal bones.

It is easy to believe when we see these large numbers of cerebral hemorrhages at post-mortem that nearly any child may have hemorrhage of the brain but it ordinarily ceases as soon as the trauma is relieved and the head returns to normal. But if there is a tendency to hemorrhagic disease of the newborn, there may be constant bleeding, until the clot becomes too large to be entirely absorbed. However, many of these cases which showed hemorrhages in other organs did not show clinical symptoms of hemorrhagic disease of the new-born. A few showed only hemorrhage from the mucous membranes before death, and cerebral hemorrhage was an entirely accidental autopsy finding.

Therefore, we have showed by autopsies upon these infants dying in early life that hemorrhagic disease of the new-born with hemorrhages in various organs may exist without definite clinical symptoms, and that it is responsible for more cases of cerebral hemorrhage of the new-born than is the trauma of a difficult labor.

DR. J. C. LITZENBERG, Minneapolis: When Dr. Warwick made her report on the pathologic findings of hemorrhage of the new-born, for a few minutes the obstetrical department felt that she had vindicated the obstetrician from his liability for all of these hemorrhages, but at the same time she and Dr. Rodda have put upon us further responsibilities and two additional burdens. We must not take this vindication too seriously because we will find in larger series that many of these hemorrhages are really due to bad obstetrics and that many of these cases are preventable, two responsibilities that are put upon the shoulders of the obstetrician and, therefore, upon the general practitioner because he is the universal obstetrician.

Dr. Warwick has pointed out that some of these hemorrhages are beginning hemorrhages and Dr. Rodda has pointed out that if injections of blood are not made early enough these beginning hemorrhages will slowly accumulate and cause death or morbidity especially the mental cases, later on. That puts upon us a definite responsibility.

In discussing Dr. Rodda's paper in the Medical section this morning I closed by saying that I would predict that in the not distant future the responsibility would be placed upon the man delivering a woman who does not take the bleeding and clotting time of the infant's blood.

The other responsibility that is placed upon us, the obstetrician and the general practitioner, is this, the early detection of hemorrhage, particularly cerebral hemorrhages, because part of them are curable by operation. A large percentage of them never get well; they may live but not get well. Those are the terrible cases of mental disease that are sent to our asylums and state institutions.

Now it is a wonderful satisfaction to an obstetrician who has seen a woman normally delivered and then to have his heart sink because the baby delivered has a cerebral hemorrhage, and then to again be filled with joy when his friend the surgeon operates and gives a normal baby to the family. The responsibilities that are put upon us are first, that we must try to prevent these cases of cerebral hemorrhage by better obstetrics and by examining the child not only for bleeding and clotting time but also for early symptoms of hemorrhage. Some of them cannot some of them by instituting treatment and by familiarizing ourselves thoroughly with the early symptoms of cerebral hemorrhage we can have some of those babies operated on and saved.

DR. SEDGWICK, University of Minnesota, Minneapolis: In the first place the death rate among children is very high. They say in some places the death rate during the first year of life is as high as it is at 80 years. Now in the first year, about half of our death rate in Minneapolis occurs during the first month and about half of them, according to Dr. Warwick's work at the University Hospital, are accounted for by cerebral hemorrhage. So you see how important this subject is when we stop to think of this fact. Then when we stop to think that most of it can be prevented if it is discovered in time and can be treated and lives saved and our institutions kept from being so full, that is our institutions for the insane and mentally defective, we see how im-

portant the subject is. I am prepared to say very positively for myself and for other members of the department that this is the most important thing that ever came out of the department of pediatrics. I think that is true.

Now then, I should also say a word for cooperation. It means that Dr. Litzenberg's department has turned over the children to the pediatrics department and that we have had an opportunity of studying these things. Dr. Warwick has shown us how often cerebral hemorrhage of the new-born occurs, and Dr. Rodda has recognized and shown us the relation between hemorrhagic disease and cerebral hemorrhage. This is the first time that has been done. That was due to cooperation. It has come out of the cooperation of the obstetrical, pathological and pediatric departments. I do not want you to think that we do not recognize the cooperation of the surgical department. I have seen the effect of the operations which Dr. Strachauer has made and wish to say what the others have said in regard to his efforts in saving these children.

DR. S. R. MAXEINER, Minneapolis: The necessity for furnishing blood to the infant has been fully dwelt upon. I wish to say that in my work in France and since I returned I have had occasion to do and to observe the effects of many blood transfusions. The matter of grouping the bloods of the donor and recipient is probably unsettled, but blood may be given subcutaneously without grouping. This is a great advantage in cases of cerebral hemorrhage, and hemorrhagic disease of the new born when prompt action is necessary to secure the desired effect; again the practitioner in the country might experience considerable difficulty in the grouping or in securing a suitable donor. On the other hand it is quite a safe procedure to withdraw a syringe or two full of blood from a vein of the mother and give it subcutaneously to the child. The difficulty of giving blood into the veins of the extremity in an infant is only appreciated by one who has tried, while the ease with which it may be given thru the fontanelle into the longitudinal sinus is such that I feel this is the method of choice when intravenous administration becomes necessary.

DR. O. R. BRYANT, Minneapolis: I would like to ask the essayist if hemorrhagic disease of the new born is on the increase and whether it is due to instrumental delivery or carelessness in obstetrical cases.

DR. A. C. STRACHAUER, Minneapolis (closing): In reply to Dr. Bryant as to whether hemorrhagic disease in the newborn is on the increase, and whether the more general use of the obstetrical forceps is responsible for the cerebral hemorrhage: Obstetrical trauma is one of the causes of cerebral hemorrhage and undoubtedly the indiscriminate and unskillful use of the obstetrical forceps would be followed by a higher incidence of cerebral hemorrhage. It is to be remembered that cerebral hemorrhage occurs in normal delivery as frequently as in the abnormal, and has been found before brith. Osler describes a case of a pregnant woman who died of typhoid fever and the autopsy showed cerebral hemorrhage in the unborn child. The apparent increase in the number of these hemorrhagic cases is probably due to an increasing recognition of the condition.

Dr. Sedgwick has referred to the cooperation obtaining between the departments at the University Hospital. As some of you know, in the University clinic the newborn child, as soon as the cord is tied, is turned over to the Pediatric department. This has resulted in the infants getting better care and much study, as a result of which attention has been called to a number of interesting conditions in the newborn. Too frequently the newborn child is neglected. The obstetrician after having accomplished a successful delivery feels that his duty to the child has been completed. Dr. Rodda's work on the blood of the newborn alone has conclusively shown that these infants deserve and require routine care.

The profession has been extremely slow in interesting itself in the subject of cerebral hemorrhage and in giving the unfortunate victims of the condition adequate attention.

There are three milestones in the slow development of the correct understanding of the subject of cerebral hemorrhage. While Little was the first to call attention of the general profession to the condition, his conception of the disease was wrong in that he considered the hemorrhage to be into the cord. It was Sarah McNutt, in 1885, who established the relationship between Little's Disease and cerebral hemorrhage, based upon autopsy findings. Not alone did she demonstrate the pathology of the condition, but she suggested craniotomy as the appropriate treatment. It required twenty years, however, before Cushing, in 1905, began the performance of craniotomy for cerebral hemorrhage.

The third milestone has been the result of the study of the blood of the newborn. This is probably the most important piece of information regarding the condition, first, in that it permits of the early recognition and even anticipates the development of the various lesions, and what is more important, makes possible prophylactic treatment.

DILATATION OF THE UPPER PORTION OF THE INTERNAL SAPHENOUS VEIN SIMULATING FEMORAL HERNIA*

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Trendelenburg has called attention to the frequency with which varicose veins are associated with incompetency of the valves guarding the orifice of the internal saphenous vein. Occasionally a dilatation of the upper portion of this vein occurs which very closely simulates femoral hernia. The valves guarding the opening between the internal saphenous and femoral veins are the first to be found between the heart and the peripheral circulation of the lower limbs; they prevent the tension which in their absence would be thrown on the superficial veins of the extremities by the column of blood in the vena cava and the iliacs. It seems probable, therefore, that the increased tension in the superficial circulation which occurs when these valves have become incompetent is the most likely factor in the production of a dilatation of this portion of the saphenous vein.

A dilatation of the saphenous vein does not often produce a swelling which would be ligely to be confused with femoral hernia; recently I have seen a patient, however, in whom the swelling which would be likely by experienced clinicians. Exploration of the femoral ring failed to reveal a hernia and after operation the original condition again developed. The clinician who had originally examined the patient now made a diagnosis of obturator hernia: a second clinician diagnosed recurring femoral hernia. The true condition, however, was recognized by the surgical consultant, and a second operation corroborated his diagnosis, namely a conical dilatation of the upper portion of the internal saphenous with an enlargement of the orifice between the femoral and internal saphenous veins.

The diagnosis of the condition is not difficult if an effort is made to distinguish it from femoral hernia. The swelling in both conditions appears in practically the same location; the tumor produced by the dilatation of the

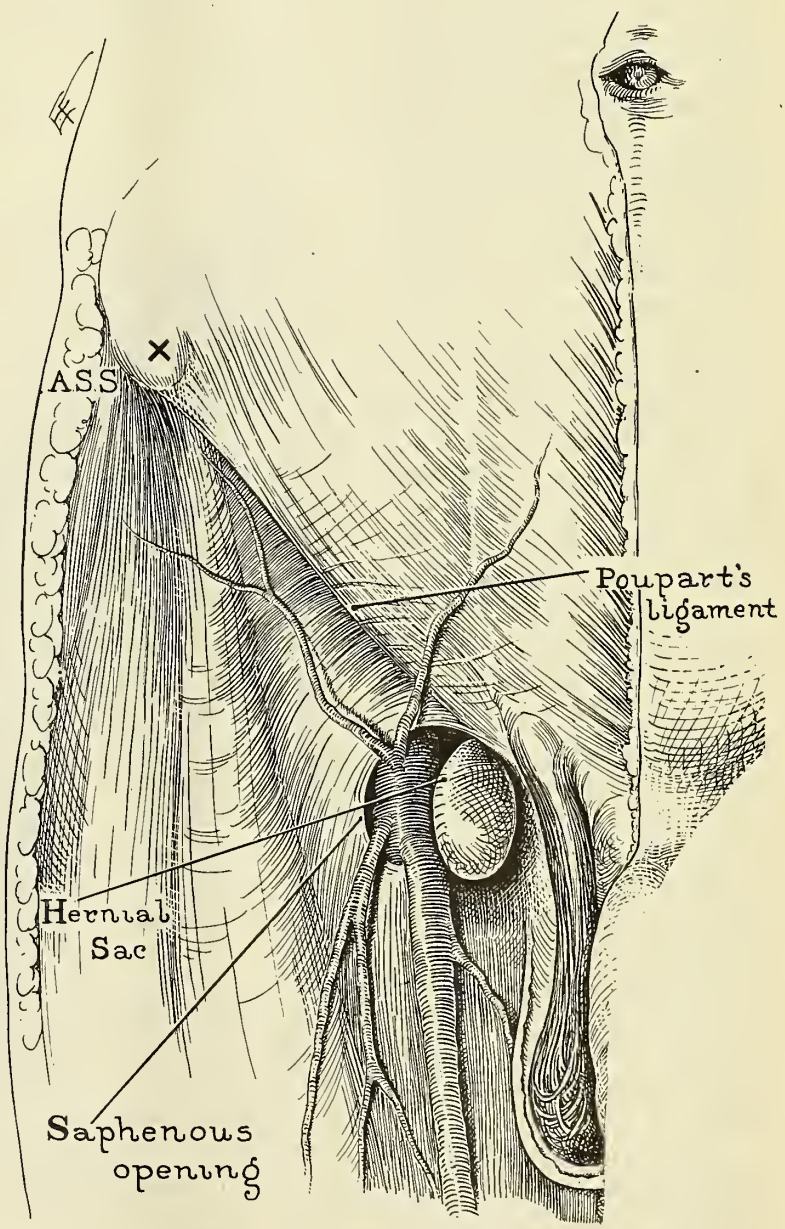

Fig. 1. Position of hernial sac in femoral hernia.

vein is a little lower than that produced by femoral hernia. If pressure is placed on the tumor caused by dilatation of the vein it immediately disappears; the tumor also disappears if the patient lies down, particularly if the leg is elevated. In cases of small femoral hernia the tumor, which is usually produced by a piece of fat that has been pushed down through the femoral opening and become attached or strangulated in this position is often irreducible and does not disappear when the patient lies down or when the leg is elevated. If the dilated vein is emptied by pressure while the patient is standing the tumor immediately recurs when the pressure is released. Both tumors give a sense of protrusion on coughing but with dilata of the vein a definite thrill is imparted to the palpating finger when the patient coughs. In operating on the patient mentioned, the vein was doubly ligated close to its juncture with the femoral and then the ordinary operation for varicose veins was performed.

Most of the literature on this subject has dealt with a condition in which a saphenous varix simulated femoral hernia, and nearly all of these reports have been published by surgeons who had become interested in the condition through having mistaken it for femoral hernia. Richardson calls attention to an article on the subject which was published by Boinet in 1836. It seems that both a dilatation of the upper portion of the saphenous vein and a definite saphenous varix occur, and that either may be mistaken for femoral hernia.

In operating recently on a patient with a tumor almost similarly placed but which was definitely recognized as a dilatation of the internal saphenous vein, I found a varix about 2 cm. by 3 cm. of the internal saphenous vein, beginning at a point about 1.8 cm. to 2 cm. below the juncture of the internal saphenous vein with the femoral.

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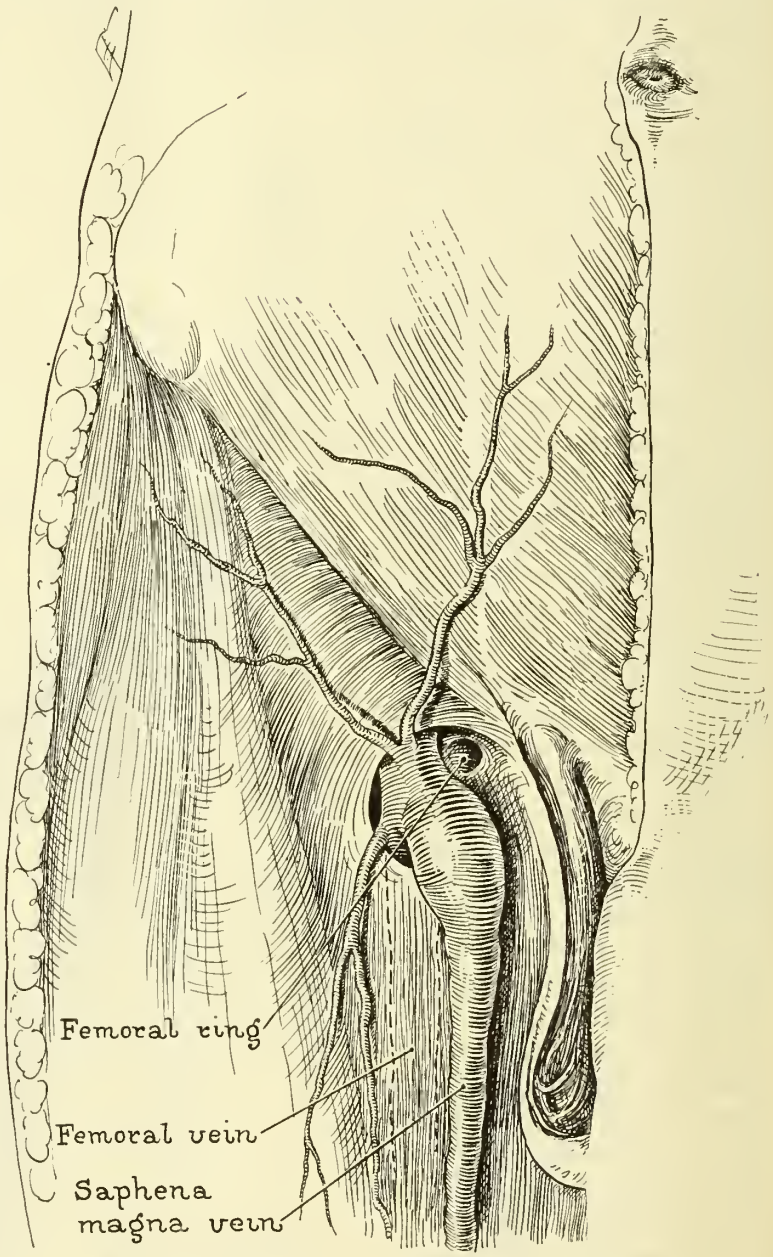

Fig. 2. Drawing showing close proximity of dilated internal saphenous vein to femoral opening in which case it could be mistaken for femoral hernia.

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THE VALUE AND SIGNIFICANCE OF BLOOD PRESSURE IN OBSTETRICS*

By Albert G. Schulze, M. D.
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The history of blood pressure estimations dates back to the year 1733 when Stephen Hales published his experiments and findings along this line. From that time down to the present the history of this procedure, so valuable as a diagnostic aid, has been one of uninterrupted progress. Many experimenters entered the field, each introducing slightly improved technique and many producing new, better and less cumbersome instruments, until now we have several instruments which are very satisfactory and reliable and have succeeded in evolving a technique which leaves little more to be desired.

Life insurance companies very early recognized the importance of blood pressure as an aid in estimating present physical fitness and in determining the longevity of applicants, and much valuable information has been afforded by their work.

Fisher, Medical Director for the Northwestern Life Insurance Company in 1911 and 1912 reported the experiences of his company. Of 723 applicants rejected who had an average blood pressure of 171 mm. Hg., 358 had one or more other ailment of sufficient seriousness to serve as a reason for rejection. In 38 per cent of them albumin, either alone or in combination, proved to be the other ailment. Of the remaining, numbering 365, whose only reason for rejection was a blood pressure of 170, one-third developed an allied impairment. Of this number over 60 per cent showed albumin, either alone or in combination, as the later developing impairment.

This shows that not only is there a striking parrallelism between a high blood pressure and a coincident or later developing kidney condition but that blood pressure estimations better than any other diagnostic test are the heralders of this condition. In view of the fact that albumin, either alone or with casts, is always present in a fully developed case of eclampsia the obstetrician can derive much benefit from the experiences of the life insurance companies.

Janeway has been quoted as saying, "I believe that blood pressure determinations should be made during pregnancy whenever the urine is examined and for the same reason. As a guide to the seriousness of a pregnancy nephritis and its liability to terminate in eclamptic convulsions such a record would be far more adequate than the usual urinary report."

That a growing interest is being taken at the present time in the importance of blood pressure in pregnancy and greater value placed on it is evidenced by the increased literature on the subject and the great amount of data now available. Improved technique and the more correct interpretation placed on the usual and the unusual readings all point to the progress that is being made along this line.

The most approved technique is the auscultatory method with a 12 cm. cuff and a reliable instrument. The reasons why the results and observations of the older experimenters have but a relative value is because of the inaccuracy of their instruments and the use of the narrow cuff. The cuff should be placed around the bared arm above the elbow, with the patient at ease in the sitting posture and the arm resting comfortably on a table in such a manner that there can be no restriction at either the elbow or the shoulder and at such a level that the arm does not hang. Readings taken while the patient is under a nervous strain or excitement or still suffering from the effects of physical exertion are of no avail.

Vogeler, writing in 1907, took all his readings in the dorsal position and at 9 A. M. The dorsal position may be satisfactory so far as Vogeler's

*Read before the Ramsey County Medical Society, St. Paul, September, 1920.

own observations may be concerned or the interpretation that may be given them regarding the welfare of the individual patient, but in comparing his observations and conclusions with those of other men, this point must be kept in mind. The dorsal position does not serve as an index of the average or usual position assumed by the pregnany woman throughout the day. Between the recumbent, sitting and the upright positions, the sitting position offers the better index and blood pressures taken while the patient is in this position should be used.

The cuff is inflated until the brachial artery is occluded as indicated by the loss of the radial pulse. Placing the stethescope, without pressure, on the forearm just below the bend of the elbow and slightly to the radial side, the pressure is reduced by release of the air and the reading noted when the sound caused by the returning circulation is first heard; also the reading at which point the sound suddenly reduces and becomes less distinct. The majority of observers agree that these record the systolic and the diastolic pressures.

In order that a series of readings may be reliable and of value, they should be taken under the same conditions; namely, the patient must be in the same posture for each reading, they should be taken by the same person, with the same instrument and under similar conditions, for blood pressure normally varies from 90 to 140 or 145 mm. depending on the individual's activities.

That we may learn the significance of blood pressure in pregnancy and the meaning of any variations from the normal, it is necessary first of all to learn what the normal may be.

In a series of 50 consecutive private patients I found that the average of 12 readings taken at the fourth month was 109.5; the average of 18 at the fifth month was 110; the average of 21 at the sixth month was 111.5; the average of 18 at 6.5 months was 113; the average of 21 at 7 months was 112.6 the average of 26 at 7.5 months was 114.6; the average of 34 at 8 months was 114.6; the average of 36 at 8.5 months was 117.3; and the average of 24 at 9 months or practically full term was 119.5. The average of 210 readings taken in 50 patients pregnant from the fourth month to full term was 117.25, and the rise from the fourth to the ninth months was exactly 10 mm Hg.

Baily in 1136 readings on 145 women in the last four or five weeks of pregnancy found 118 mm Hg to be the average.

Irving in a series of 5000 readings ranging from 80 to 225 mm Hg found that 80 per cent were between 100 and 130.

Haussling in a series of 436 readings found only 37 (85 per cent) to be below 95 or at 140 or above and the remaining, or 399 (91 per cent) to be between 100 and 135 with an average of 115. He concludes that a blood pressure of 100 to 135 is a normal fluctuation, with 80 and 150 as the low and the high limits of the normal.

Newell placed the average at 118 mm with a gradual rise of 10 to 15 in the latter months of pregnancy. In his series of 450 cases he found only one case where the blood pressure remained within the range of 100 to 130 which developed any abnormal symptoms.

Danforth, reporting his observations in 447 cases, found the average systolic pressure to be 114 and concludes that the average blood pressure of the pregnant woman is less than that of the non-pregnant woman. This is a startling statement but it appears to be true.

Vogeler never found it to be above 150 and Janeway states that a blood pressure above 160 does not exist in normal pregnancy.

The slight rise so commonly observed throughout pregnancy was explained by Gneechi in 1903 as being due partly to a left-sided cardiac hypertrophy, partly to the much increased intra-abdominal pressure and partly to an autointoxication; but since Stengel and Stanton demonstrated quite conclusively a few years later that cardiac hypertrophy does not take place in pregnancy, the first of Gneechi's explanations does not hold true and we must explain the rise as being due either to a toxemia or to the intra-abdominal pressure.

That intra-abdominal pressure may be an etiological factor has considerable clinical support. Eclampsia, as we shall see later, is generally associated with a high or a gradually rising blood pressure and is much more frequent in twin pregnancies and in cases of hydramnios and occurs with surprising frequency in primiparae, in all of whom intra-abdominal

pressure is much increased. Whatever the cause may be, the rise should not be over 10 to 15 mm and is reached about one week before labor.

While the average blood pressure in pregnancy may be stated to be about 115 and the range of normal to be from 100 to 135, this should not be interpreted to mean that a patient having a pressure within these limits might not be eclamptic nor that a pressure higher than the upper limit necessarily spells eclampsia.

For instance, Bailey reported in 1911 two cases of the fulminant type of eclampsia with a blood pressure of 70 and 75 mm both of which proved fatal. Little in 1908 reported a series of 40 cases of eclampsia in three of which the blood pressures were 125, 133 and 150 mm.

Regarding a low blood pressure, Lynch stated that it may be found in patients with no other evidence of abnormality but warns that an extremely low blood pressure may be a forerunner of postpartum shock without a contributing hemorrhage. Unfortunately he bases his observations on only two cases in a series of 100 whose blood pressures were below 90 mm. Irving agrees with Lynch in the first of these two statements for in his series of 5000 cases a pressure below 100 mm accured in 9 per cent of the cases and he is of the opinion that a low blood pressure is rather common. With the second of Lynch's statements Irving, however, does not agree, for in his series he had 44 cases of low blood pressure and in not a single instance did shock take place unaccompanied by hemorrhage following labor. Seven of them had a pressure of 80 mm.

In another series of 357 cases of blood pressures between 90 and 100 mm shock did not occur a single time unaccompanied by hemorrhage after normal delivery and only four times after operative delivery. Irving concludes that this tendency to a low blood pressure is apparently an individual peculiarity and that it does not necessarily point to a poor reaction after labor.

Crile explains post-partum shock as being due to the rather sudden reduction of intra-abdominal pressure which allows the blood to rush to the splanchnic area in a manner which is beyond vasomotor control.

Vogeler, Bailey and Newell found no constant difference in blood pressure between primiparae and multiparae nor did age seem to be a factor and Newell stated that a normal blood pressure is to be expected in spite of age and parity, and a high pressure must be due to other causes.

Irving's figures and tables, however, would lead one to a slightly different conclusion. For instance, he found 13.8 per cent of elevated blood pressures in 177 septiparae and only .6 per cent of them showing symptoms of toxemia. He found his next highest per cent of elevated blood pressures (12.2) in primiparae with double the per cent showing symptoms of toxemia and in primiparae as a whole he found a higher per cent of albuminuria than in any of the others in his series.

Furthermore, regarding age, he found a larger percentage of elevated blood pressures in women under 20 years of age than in those between 20 and 30 years and in all his 5000 cases by far the largest percentage of albuminuria and toxemia were found in those under 20 years of age. Irving offers no explanation. Newell reports a case of eclampsia in a patient only 18 years of age. Haussling reports a case which had had two convulsions and other symptoms of eclampsia but with a blood pressure of only 110 mm.

Twenty-two years ago Vaquez and Nobecourt made the statement that blood pressure is unusually high in eclampsia and this is the view generally held and no doubt it is true in the large majority of cases. Many cases are on record, however, where true eclampsia with convulsions developed with a blood pressure remaining well within the limits of normal, if not even low. Vogeler, on the other hand, saw that a high blood pressure could exist and continue with convulsions and with only a small amount or no albumin in the urine. Consensus of opinion now is that it is not so much the height of the blood pressure as its tendency to gradually creep higher that suggests an oncoming eclampsia. Also, a high blood pressure, not showing a tendency to mount and not accompanied by symptoms of eclampsia, need not necessarily be alarming.

The interesting and all important question that arises now, is, what does blood pressure in obstetrics teach us and what is its value as

compared with urinalysis in diagnosing the eclamptic or the pre-eclamptic state. Irving brings this out nicely in the record of his observations. He, as well as Haussling and Newell, admits that the presence of albumin in his series of cases often was due to leucorrheal contamination, and some observers have reported the presence of albumin in even a catheterized specimen without its signifying a pathological condition. In view of this Irving concludes that an elevated blood pressure, per se, rather than an albuminuria, is the more frequent and reliable sign of a toxemia. He found that it preceded an albuminuria in twice as many cases as those in which it followed albuminuria when they were not discovered together. Newell found a high blood pressure preceding albuminuria over three times as often as albuminuria preceding an elevated pressure. In all of his cases that developed toxemic symptoms a rising blood pressure was the first symptom with but one exception.

Irving has shown diagramatically that when a blood pressure is below 150 mm only a reasonably small per cent of them develop toxemia but the moment that it goes above 150, one-third of them develop it; when above 160, one half and above 180, all of them do.

This parallelism between a high blood pressure and an on-coming eclampsia is not revealed by any other diagnostic test which we have at our command at the present time. For instance, and again quoting from Irving he found almost 45 per cent of cases developing toxemia when they showed a "trace" of albumin, but in those showing a "large trace" contrary to what one would expect, only 15 per cent of them developed toxemia, showing that albuminuria is not an index of toxemia and that the two do not travel hand in hand.

As the blood pressure mounts the percentage of cases developing albuminuria and toxemia mount also and in a manner that is strikingly uniform. Using albumin as an index, when it is present or increases, it is true that the percentage of cases developing an elevated blood pressure and toxemia increases also but not uniformly with the albumin, but again strikingly uniform with each other.

During labor blood pressure rises with each uterine contraction to drop again after each pain. In the early part of labor the drop is to the level of what it was before labor set in. As the second stage advances, the pains becoming harder and of longer duration, this rise in pressure is greater and its drop between pains is no longer to the level of the patient's normal.

This rise of blood pressure during labor might be explained by the contractions of the muscles, those of the extremities, abdomen, uterus and diaphragm. Vogeler, has shown, however, that this blood pressure rise during labor is a constant factor and does not decline when the patient is under the anesthetic, and either Cook or Lynch observed some time ago that the painless physiologic uterine contractions taking place during pregnancy also cause a rise in pressure differing only in degree from the rise occurring during the contractions of labor. It may be that the uterine contraction alone is sufficient to explain it.

The rupture of the membranes, resulting in a reduction in the intra-abdominal pressure, is followed by a drop in the blood pressure. This also follows the birth of the head, and a quick return to the normal follows the birth of the child. On account of intra- and post-partum eclampsia it has been advised that the blood pressure be taken early in labor and again immediately after.

In a series of 145 consecutive cases in my service at the City Hospital I found that the average of 75 blood pressure readings taken when the patient was at full term but not in labor was 123.5; the average of 86 readings taken as near as we could in the second stage of labor was 133; and the average of 104 readings taken as near as we could three hours after labor was 120 mm.

Haussling found in 246 post-partum readings that the limits of normal were the same as in ante-partum cases with an average of 110 mm, a slight reduction.

All intra-uterine manipulations cause a sharp rise of blood pressure irrespective again of the anesthetic. This has been found to be most marked during traction on the child as by forceps or breech extraction.

The failure of the blood pressure to decline after all other symptoms have disappeared makes the prognosis much more unfavorable.

An interesting question arises in the relation-

ship of blood pressure to convulsions, and Ervin of Cincinnati has worked this out. He has shown by observation and experiment that the immediate factor in the production of a convulsion is the disturbance in the normal relationship existing between blood pressure and intracranial pressure. Blood pressure is a factor in the maintenance of the intracranial pressure and is always the higher of the two and the difference between them is the margin of safety. The eclamptic toxine, whatever it may be, produces a cerebral edema which acts as a vasomotor stimulant causing a rise in blood pressure. This increased blood pressure causes in turn more intracranial pressure which in turn has the same effect on the blood pressure. These two factors, acting on each other, form a vicious cycle, which results in the blood pressure and the intracranial pressure chasing each other higher and higher. There comes a time, however, when vaso-motor stimulation becomes vaso-motor paralysis with the result that the blood pressure drops and the intracranial pressure is momentarily the higher of the two and a convulsion takes place. Intracranial pressure, however, being no longer supported by the blood pressure, also begins to drop. The convulsion, with the attendant exertion and muscle contraction, again restores the blood pressure and tends to establish the normal relationship existing between itself and the intracranial pressure.

In his experiments Ervin has watched the blood pressure drop from the high reading of 190 mm Hg to a low level, followed by a convulsion, in the course of from two to eight minutes. The time it took for the blood pressure to drop and the point at which the convulsion took place seemed to be quite constant in the same individual. When he saw the pressure coming down, suggesting the approach of a convulsion, he gave a hypodermic of epinephrin which caused the blood pressure to rise and no convulsion took place. After a convulsion had occurred and when the blood pressure was on the mount again, he gave a hypodermic of nitroglycerine which brought the blood pressure down to be followed by another convulsion.

He suggested that in order to make our treatment most effective it should be directed against the cerebral edema.

These observations and experiments of Ervin are supported clinically and are in accord with Cushing's pressure symptom complex. The elevated blood pressure should be interpreted as Nature's effort to overcome the intra-cranial pressure and maintain sufficient circulation to prevent a bulbar anemia with a rapidly following fatal termination. When the vaso-motor system fails and the blood pressure drops as was shown by Ervin, would death not be imminent if a convulsion did not restore the normal relationship between the blood pressure and the intracranial pressure and why should not that most tragic of all clinical manifestations, an eclamptic convulsions, be a last final effort on the part of Nature to ward off a fatal termination?

SUMMARY

1. A series of blood pressure readings properly taken rather than a series of urine analyses, serve as an index of the eclamptic or the non-eclamptic condition of the patient.

2. The normal range of blood pressure during pregnancy has been found to be between 100 and 130 mm Hg, with 114 to 118 as an average.

3. As a matter of instruction it may be advised that if the blood pressure is below 100 be prepared for shock; if above 150 it is no longer to be regarded as normal.

4. A moderately high blood pressure that shows no tendency to mount and which is not accompanied by symptoms of eclampsia is not necessarily serious; a pressure, even if low and unaccompanied by symptoms of eclampsia, but which does show a tendency to mount, should be regarded with suspicion.

5. A gradual rise in blood pressure takes place throughout pregnancy, not simply in the last months of pregnancy and during labor. After delivery a return to the low level takes place.

I wish to acknowledge my indebtedness to the internes at the City Hospital for tabulating the readings for me.

THE WASSERMANN TEST—A PLEA FOR A STANDARD METHOD*

By Joseph C. Ohlmacher, M. D.
Vermilion, S. D.

The primary object in presenting a paper of this nature before a society composed mostly of praeticing physicians, is to stimulate interest that may result in a concerted adoption of a standard Wassermann test, trusting that such an appeal, coming from those so closely interested in the matter, might result in its adoption, or at least the uniform adoption of basic principles and methods. That there is need for a standard test is very evident to the scientifie laboratory worker, and should be apparent to the thoughtful elinieian.

Before discussing this phase of the subjeet, it might be well to present some data illustrating the value of the Wassermann reaction, as an aid in the diagnosis of syphilis. I wish also to direet your attention to certain things that will, if put into praetiee by the clinicians and the various laboratory workers, greatly enhanee the value of the test.

The Wassermann test, including a number of its modifications, is coneeded by most authorities to be the best single test we have for syphilis. Syphilis with its manifold and often bizarre symptoms; its frequent failure to develop typical signs and symptoms during different stages of its progress, and its numerous manifestations during its later stages, so closely approximating those of other disease proeesses, often taxes the diagnostie acumen of the best clinieal observers. They, in keeping with the majority of the profession, have come to rely largely upon the Wassermann test as a court of appeal, if not a court of last resort. Just how mueh we may rely upon the test, when properly performed, is shown by the recent writings of sueh authorities as Craig, Kolmer, Ottenberg and many others.

For several years following the introduction of the Wassermann test and its earlier modifications, reports indicated that it was only about fifty per cent reliable. Now, however, increased teehnieal preeision ineluding various controls to offset the possibility of grave error; the introduction of more sensitive reagents and methods of complement fixation; have greatly increased the value of the test. Thus with such delieate and reliable methods as Craig's and the icebox fixation method of Smith and McNeal, Zinsser and others, the pereentage inerease of positives, in the various stages of syphilis, has about doubled. Surprising as it may seem to some of you, the fact is that about ninety per cent of positives are obtained in primary syphilis, that is, any time between the appearance of the initial lesion and the appearance of secondary symptoms. In this connection, it may be of interest to eite the findings of Craig in six hundred eases of primary syphilis. He obtained thirty-six per cent of positives at the end of the first week; sixty per cent positives at the end of the second week; seventy per eent positives at the end of the third week; seventy-five per eent positives at the end of the fourth week and eighty per eent positives five weeks after the beginning of the chancre.

Vedder examined thirty-one eases of primary syphilis with both the complement fixation test and the dark field method, obtaining the following interesting results: Dark field was positive and the Wassermann negative in ten cases ranging from two days to one month; dark field negative and Wassermann positive in six cases ranging from one week to one month; twelve cases gave positive with both tests in cases ranging from seven days to two months and two cases were negative with both tests. These findings are signifieant, and demonstrate the advisability of performing both tests if possible, in all cases of primary syphilis in which one or the other test fails. This procedure might well be applied in cases of secondary syphilis presenting distinct and easily accessable lesions.

The results of the eomplement fixation test in seeondary syphilis, are most gratifying. Here the average of positive findings of twelve competent observers is ninety-four and eight-tenths per eent. This confirms Craig's eontention that about ninety-five per cent of the cases of seeondary syphilis, unless more or less prolonged treatment had been given, gave a positive Wassermann. It is in this stage of the disease particularly that one or repeated nega-

*Read before the Sioux Valley Medical Association, at Sioux Fall, S. D., June 23, 1920.

tive reactions assume no value in excluding cases clinically syphilis.

In tertiary syphilis ninety-five per cent of positives are obtained providing the following cases are excluded: Cases without definite symptoms; cases under vigorous treatment or which have recently been under vigorous treatment and cases in which tertiary symptoms have never appeared.

The usual run of cases received from day to day, give from eighty to eighty-five per cent positives.

In latent syphilis, that is, in such cases as have shown no clinical symptoms over long periods of time, the complement fixation test, when properly applied, gives positive results in about sixty-eight per cent of the cases. This reaction, being the sole criterion of the disease in cases of latent syphilis here assumes greatly added importance. In passing, I wish to remark that it is from the ranks of the latent syphilitic that most of our cases of tabes and paresis are recruited.

In congenital syphilis, in children showing the lesions of the disease, complement fixation is present in practically one hundred per cent of the serums tested. In children exhibiting late manifestations of congenital syphilis, the percentage of positives ranges from seventy to eighty-five. The complement fixation test applied to this class of cases, has added much light to our knowledge of congenital syphilis. Thus we must regard Colle's law, which implies that an apparently healthy mother of a syphilitic child may suckle her child with impunity, as untenable. The same must be said of Profeta's law, which implies that a child born of a syphilitic mother, but presenting no evidence of syphilis, may suckle its mother without acquiring the disease. In this connection, I wish to call your attention to the fact that the wife or husband of a paretic or tabetic may acquire the infection, as is shown by the application of the Wassermann test, without showing the earlier signs or symptoms of the disease. In such cases the disease is apt to remain latent for years, to eventuate in a frank case of paresis, tabes or other late form of the disease. This demonstrates the advisability of applying the complement fixation test to all such cases.

The value of the Wassermann test in cases of cerebro-spinal syphilis, paresis and tabes, is shown by the following data: In cerebro-spinal syphilis the blood is positive in from sixty to seventy-five per cent and the cerebro-spinal fluid gives one hundred per cent positives. In paresis the blood is practically one hundred per cent positive. In tabes the blood is about seventy per cent positive and the cerebro-spinal fluid is about ninety-five per cent positive (Craig).

Bear in mind that one may meet with cases of frank syphilis and even some showing the presence of widely distributed treponema, as has been shown by Warthin, in which repeated blood tests fail to give a positive Wassermann. Though such cases are Wassermann negative, they must be regarded as syphilis and treated accordingly. Again there are a somewhat larger number of cases of frank syphilis which may show a doubtful plus or negative Wassermann on one or more occasions, in which repeated examinations, following or without the provocative salvarsan application, will eventually show a strongly positive reaction. This illustrates that a single negative Wassermann, in a case having the clinical signs of syphilis, should never be regarded as final.

So much has been and is still said about getting positive complement fixation in other diseases than syphilis, that a few words on the subject may not be amiss. A positive Wassermann is quite often obtained in cases of yaws. This is not surprising when we remember that this disease is also due to a treponema. However, we are not apt to meet with this disease in this country, so it need not unduely disturb us. A few cases of tubercular leprosy give positive Wassermann reactions as well as some cases of tuberculosis and some of malaria during the febrile stage. In the majority of such cases it is impossible to exclude syphilis.

Now just a few words as to how the clinician may aid the laboratory in augmenting the value of the Wassermann test. First, there is the problem of hemolyzed blood. Serums tinted with the products of hemolysis are very apt to give false reactions, especially false positive reactions. They should not be tested on this account. It thus behooves the physician to procure his specimens of blood in such a manner

as to obviate the possibility of hemolysis. The chief causes of hemolysis are extremes of temperature to which the blood is subjected; effects of shaking during shipment; faulty methods of procuring the blood and so forth. When an attempt is made to procure a specimen of blood by puncturing the finger or ear, hemolysis is apt to occur, due to the vigorous rubbing or squeezing of the part; practices often resorted to when the blood fails to flow freely. Drawing the blood into a syringe in which there is the least water, alkaline or acid substance, frequently results in hemolysis. A syringe that is sterilized by boiling should be thoroughly dried before using. This may be quickly accomplished by drawing ether into the barrel and then forcing it out. The ether rapidly evaporates, leaving a dry surface. Another expedient is to draw sterile, normal, salt solution into the syringe as soon as it has been boiled, and at once forcing it out. Here one need not wait for drying to be accomplished. Except in cases of extremely nervous or young children, it is not necessary to resort to puncture of the ear or finger. Any one who has practiced this procedure as well as venopuncture upon himself, will sustain my contention that venopuncture when properly done, is the method of choice from practically every stand point, including particularly, that of discomfort to the donor. In this connection, may I suggest to those who find more or less difficulty in locating and puncturing a vein at the bend of the elbow, particularly in extremely fat people, that they will find a readily accessable source of blood supply, by utilizing the vein that passes over the outer or inner malcolus and which can be made to stand out prominently by applying slight approximal strictnre.

The best way to send specimens to the laboratory for the Wassermann test, is to send only the serum and not the whole blood. When the blood is obtained it should be set aside in the ice box or other cool place until thorough clotting has taken place and the serum then collected into a small, sterile vial, stoppered with a boiled cork, sealed with paraffin or the like, and then sent to the laboratory.

Laboratory workers are fairly well agreed that blood for the Wassermann test must be kept sterile, and this point is fairly well established among the practitioners of medicine. However, if one is to judge by the condition of some of the specimens that arrive at the laboratory, he must believe that strict asepsis is occasionally neglected in procuring blood for this purpose. Blood infected with certain kinds of bacteria, give false positive reactions, and this source of error the clinician and the serologist must guard against.

Another thing that must be taken into consideration when procuring a sample of blood for the Wassermann test, though possibly to a less extent than prior to the first of July, nineteen hundred and nineteen, is the possibility of the patient having imbibed alcohol in considerable amounts shortly before the blood is taken. It has been shown by Craig and others that if alcohol is taken in appreciable quantities within three days of the time the blood specimen is obtained, it is apt to convert a strongly positive serum into a negative one.

Again it is well to remember that cases of untreated syphilis are met with, particularly in the primary and latent periods, in which the complement binding power of the serum may vary greatly from day to day, and in some cases, during different hours of the same day. Thus, on one day a serum may show negative or weakly positive and on the day following be strongly positive. Treated cases are most apt to vary in this manner. The practical value of this finding, is that too much credence must not be placed on one negative test, in a case of suspected syphilis. It is the habit of some physicians, and a most commendable practice, to send specimens of serum from suspected luetic cases, to two or more laboratories, so as to check up on the results. Obviously, in view of the above findings, such a check can not, in the event of divergent results, be of practical value unless the blood sent to the different laboratories be identical in every respect. This is a matter frequently overlooked, and leads to unnecessary confusion and sometimes to unjust criticism. Another thing that may lead to divergent results, and which the physician can obviate to a large extent, is the practice of sending a sample of blood to a laboratory near home and another sample to a laboratory so far from home, that the time factor may prove important in permitting changes to take place in the blood that partially or completely alter the reaction. Since these changes are

much less liable to occur in blood serum alone than in whole blood, the method to pursue to largely offset the possibility of error, should be clear to all.

I now wish to briefly refer to the various methods of conducting the complement fixation test for syphilis, without, however, subjecting you to the misery of listening to technical details. There are twenty or more methods, besides the original Wassermann, for carrying on this procedure. Most of these methods vary but slightly, though some are so changed as to have lost all semblance to their original progenator, the Wassermann test. A few of the modifications have enriched the Wassermann test, though most of them appear to be sorry makeshifts, and have done little more than bring about confusion. Such modifications as Noguchi's, Craig's, Kolmer's, Smith and McNeal's icebox fixation method and a few others, are of great value and have added to the sensitiveness and reliability of the original test. The tests chiefly vary in the kind of blood cells, amboceptor and antigen employed, and to a less extent in the quantity of the reagents and the kind of controls used. As you probably know, Noguchi employs the anti-human hemolytic system chiefly because it negates error due to the presence in some serums of natural antisheep hemolysin. Fortunately this natural hemolysin, as it is called, is not present in sufficient amounts to alter the test, except in about three per cent of the cases. Personally it appears that the more sensitive method icebox fixation largely does away with this source of error.

One of the chief reasons that has actuated serologists in modifying the Wassermann test, is the desire to increase sensitiveness to the extent of including such luetic serums as give only weak positive reactions or that react negatively. The ideal system, of course, is one in which sensitiveness has reached the highest degree consistent with safety. To my mind the icebox method of fixation with the use of either the simple alcoholic extract or the acetone insoluble extract of beef heart as antigen, best meets these requirements. In our laboratory we compared this method with the usual waterbath method, and found it gave about twelve per cent more positives. We used the daily run of serums for this test, employing 2125 serums in all.

Of all the controls employed in the complement fixation test none are of greater importance than the anti-complementary control. Without this control the error in positive reports would reach as high as from five to seven per cent. Surprising as it may seem, there are many laboratories which fail to run this control.

Titration of amboceptor and complement should always be run just prior to performing the test. In our laboratory the complement is titrated against the amboceptor and the amboceptor against the complement. Antigen should be titrated at least once a month, no matter how stable it may seem. The washed blood cells must be fresh, preferably not being used later than twelve hours after they are obtained. The salt solution in which they are finally washed should be allowed to cover them until just before the cells are used in the test. Should the slightest evidence of hemloysis be noted these cells must be discarded and fresh ones obtained. Failure to be governed by these simple rules frequently results in error as all experienced laboratory men know. Carelessness in these matters is the act of the incompetent and adds to the distrust that some physicians have for the Wassermann and other tests.

This leads me to the brief discussion of the advisability of adopting a standard method of performing the complement fixation test for syphilis. Two things seem to have confused the medical mind more than all others, regarding the Wassermann test. Thus the divergent systems used by different workers for discovering and reporting the strength of the reaction, and the divergent reports on identical serums sent to different workers. If it were not so serious a matter one might well be amused at the way some laboratories report their positive findings. Thus many workers employ Citron's system of notation (four plus, three plus, two plus, etc.,) entirely ignoring the method upon which this system of reading was founded. Until some standard of reading and reporting serums is adopted, it seems better to simply report findings as "Strongly Positive" or "Weakly Positive", adding if you please the "Doubtful", or "Indefinite".

So far as divergent reports on identical serums sent to different laboratories are concerned, it may be said that they almost always occur in serums exhibiting weakly positive reactions and usually mean that one laboratory, employing more sensitive reagents and more delicate methods of complement fixation, will detect these weakly positive serums, while the other laboratory does not. The findings of most good laboratories will be found to be practically the same as far as their examinations of definitely positive or negative serums are concerned.

Though the technic of the Wassermann reaction is comparatively easy to learn none should attempt to employ it who is not thoroughly trained or who is not under the supervision of the trained serologist. You may gather what is meant by "properly trained" by the following quotation of Citron, the great pupil of Wassermann. In his book on "Immunity" he says, speaking of the Wassermann reaction: "It is comparatively easy to learn the purely technical details. All large laboratories have trained assistants for the performance of certain reactions or group of reactions with absolute percision—they are, nevertheless, far from a thorough understanding of the subject of serum diagnosis. In addition, the practical success the Wassermann reaction has met with, has inculcated the desire in certain schools of physicians, for the carrying out of this test alone, and thus to become independent of the use of large laboratories. To meet this demand, short courses have been established and the serum diagnosis of syphilis taught with lightning rapidity. That such a state of events is absolutely injurious is clearly evident. It is impossible to be a specialist in a certain reaction and at the same time be ignorant of the other phases in the study of immunity. Unreliable and erroneous results are the inevitable outcomes of such unscientific work." This criticism coming from so great an authority on the subject should bear great weight.

While in the present state of its development, it hardly seems possible for all workers to adopt one uniform Wassermann technique, it should not be so hard a matter to agree on basic principles and methods. In the mean time every physician should make sure not to entrust his work to everyone who claims to be a serologist. It is his duty to his patient to see that no one but a thoroughly competent worker makes such tests for him. On the other hand a grave injustice may be done by criticising a laboratory when its results occasionally are at variance with those of other laboratories and the clinical findings.

In conclusion, I voice the hope that something will soon be done to eliminate all confusion in the matter of performing and reporting the Wassermann test. The chief hope in this matter lies in the clinician and not the patient who is chiefly concerned. May he act.

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EDITORIAL

CANCER CONTROL

Preventive medicine has, during the past few decades, brought such remarkable results in the control of many diseases which have proven serious factors in the general mortality experience for centuries past, that the medical profession and laity as well can contemplate the control of one of our most serious scourges with a lively hope and justifiable expectation that here also similar results can be accomplished.

Cancer is responsible for approximately 100,000 deaths in the United States per annum, and is increasing. While our knowledge of the nature of the disease is still very limited, we nevertheless have sufficient data on which to base the assurance that if the medical profession, and especially the laity, had sufficient information upon which to base an early diagnosis or to raise a suspicion of the existence of cancer, and realized the high percentage of cures from early and radical operation, and from radium and roentgen rays, a considerable percentage of the present deaths could be avoided, and a long step taken in the control of this dread malady.

As in the control of tuberculosis, education is the vital feature of the campaign, so also in cancer control the layman and laywoman must be educated to early recognition of the signs and symptoms of cancer and the hopeful possibility of its cure.

The education can best be carried on by the medical profession: first, because the authority of the physician's instruction is most readily accepted, and second, because the family physician is in the best strategic position to give the instruction in a wise, sane way, without causing undue alarm or an injurious nervous dread.

The message of cancer control is alertness in recognizing early signs, and optimism in seeking an early cure.

If the physician recognizes his responsibility to the preventive field of his profession, he will see to it that every man and woman who looks to him for advice knows enough about cancer to protect themselves as far as our present knowledge has carried us in early diagnosis and treatment.

The physician who treats "indigestion," "neuralgia of the breast," "bleeding piles," etc., by prescriptions without examination, will be responsible for some preventable deaths from cancer, and he is not the man whose clientele will receive instruction enabling them to avoid the inoperable stage of cancers that could have been cured.

Many laymen and some physicians still do not recognize how many lives are sacrificed to delay in these cases. It is this message of early recognition and the hope of cure that will induce the patient to seek competent surgical aid in time. The physician who is properly conserving his patient's interest and welfare will sometimes cause unnecesary expense and inconvenience by advising a surgical consultation, but he will be acting on the safe side, and will be giving the patient the same chance he would give his own wife in a suspicious or doubtful case. Several cases of inconvenience or expense are better than one fatality from delay or neglect.

—H. W. C.

ST. PAUL CLINIC WEEK

The average physician in Minnesota is a progressive in the sense that he is always on the look-out for new and better methods of diagnosis and treatment. Problems present themselves from time to time and the physician has certain specific questions which he asks himself and desires to ask other members of the profession who have had more experience in that particular line. Searching through the literature or taking a post graduate course is time consuming and often impracticable. In some states clinical teams are sent out by the State Association or State Medical School to give clinics to the physicians throughout the state at various county headquarters. In Minnesota so-called clinic weeks serve this function.

St. Paul will hold its first Clinic Week, January 10 to 15, 1921. Some fifty clinics representing the various specialties will be held daily in the nine large hospitals in the city and every effort is being made by the Ramsey County Medical Society, under whose auspices the clinics will be held, to make the meetings a success. The two evening scientific programs will be addressed by Dr. George Crile of Cleveland, and Dr. B. H. Orndoff of Chicago. The names of other distinguished visitors will appear on the program which will be mailed in December to every member of the profession in the state.

The social side of this meeting will not be neglected and all the evenings during the week, but two, will be devoted to strictly non-scientific activities.

We are told that hotel reservations should be made through the Executive Committee, St. Paul Clinic Week, 1300 Lowry Bldg., St. Paul, Minn.

GAS POISONING AND TUBERCULOSIS

Dr. Spicer's paper on this subject which appears in this issue is not convincing. He gives it as his personal belief that in the future we shall find active tuberculosis resulting from gassing during the war. Every man is entitled to his opinion. To convince others he must show some proof.

The character of a man's medical work is likely to erroneously affect his opinions. The physician who sees medical cases for the United States Public Health Service is struck by the frequency of tuberculosis in the discharged soldiers. It is striking what a small percentage of these cases give a history of exposure in childhood. Does this mean that they contracted tuberculosis abroad or does it simply mean that they have concealed the family history in the belief that a history of tuberculosis in the family might affect their compensation. One is tempted, it is true, to jump to the conclusion that tuberculosis is on the increase in this country as a result of the war. This may or may not be true and it is too early to prove conclusively.

The tuberculosis specialist, examining lung cases, looks for tuberculosis. The desire to make an early diagnosis for the patient's benefit is strong. Many cases are diagnosed without sufficient positive findings.

The lung specialist working in a sanatorium or doing United States Public Health Service work encounters the discharged soldier who has been gassed. He sees cases of tuberculosis who have a history of gassing and is inclined to overemphasize the etiological importance of the gassing.

Those who have examined soldiers who have been gassed know that their symptoms are largely subjective. A diminished chest expansion, a questionable hyperresonance and widely disseminated non-constant rales, appear in some of the cases. Even these symptoms are not constant.

Many are the solidiers who were gassed and have no symptoms today. Many are the neuros who smelled the fumes from high explosives and thought they were gassed.

Unfortunately from the standpoint of science we know nothing about the pathology of the lung in these chronic cases. They fortunately do not die from the after effects of the condition. That many of them are markedly disabled and in all probability will remain so, no one will deny.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

REPORT OF THE SPECIAL COMMITTEE OF THE MEDICAL ALUMNI ASSOCIATION APPOINTED TO INQUIRE INTO CONDITIONS IN THE MEDICAL SCHOOL

In formulating its plan of work, the committee determined to carry it on under a variety of subheads, and its report will deal with the various phases of the inquiry in the order in which they were taken up.

Educational Policy and Ideals

It is the prime object of a medical school, supported by the state, to graduate general practitioners of medicine, who shall serve the needs of the people as medical advisers and public health councilors. Furthermore, the medical school should freely offer at all times opportunity for the general practitioners of the state to return for further instruction and postgraduate study. Efforts should be put forth to develop research workers and teachers and specialists, but not at the expense of the endeavor to produce general practitioners. The development of the fellowship system of instruction upon the campus, looking to the making of specialists, is, with the limited facilities at its command, absorbing too much of the vital force and energy of teachers and of the laboratory and hospital resources of the school and, in the opinion of the committee, operates to weaken the undergraduate instruction. The teaching demands made upon the clinical material at the University Hospital to instruct advanced students in the specialties makes it impossible to give the house officers and undergraduates the clinical opportunities required. The committee would suggest that the clinical resources of the University Hospital be devoted to undergraduate teaching and that efforts be made to utilize the large twin city hospitals in the graduate instruction.

Every department in a great institution of learning should be given a free hand in the development of its educational policy and its administration. Its autonomy must be preserved if an environment is to be created in which an institution of strong and vigorous growth may develop. Such freedom of thought and action granted to its administrative head and faculty creates initiative, a sense of responsibility, a vital interest upon the part of the teacher and student, and a loyalty in the alumni body. Such autonomy does not exist in the medical school at this time. There is a lack of any responsible leadership upon the campus, working out the school's educational policies and ideals. The committee is of the opinion that this loss of autonomy and the gravitation of the control of educational policies and administration into the Board of Regents robs the school of one of its most vital elements of growth and development. Such a course operates to disorganize administration, nullify leadership, demoralize discipline, and crush initiative.

The committee approves of the fifth or interne year as a requirement for graduation, first instituted at Minnesota, and also the assignment of students during their senior year in interne service, provided the student is placed in a service manned by competent men and carfully supervised.

In the selection of the heads of departments, the committee finds no well developed method of procedure and would suggest that hereafter some mechanism be devised by which the department affected may have the privilege of submitting nominations in the case of a vacancy and, furthermore, that the advisory committee of the alumni association be requested by the Dean of the school to submit nominations for consideration.

Undergraduate Instruction

Institutions, like men, are subject to many failings and defects. In this day of rapid additions to medical knowledge, there is grave danger in attempting to teach too much in order to cover the field. The student leaves medical school with his head crammed full of theories, irrelevant facts, and abstract knowledge, much of which is of no real use to him in the practice of his profession and takes an enormous amount of his time to acquire. The fundamental branches are being taught more and more as a pure science. The applied relationship of these sciences to the practice of medicine is nearly lost sight of. This is a real fault in the undergraduate instruction at the University. It can be remedied by selecting as teachers in the primary branches men who have received their training as physicians and possess the faculty of weaving into the instruction interesting and valuable points in its practical application. Such methods serve to whet the appetite of the student for medical knowledge and stimulate his interest in study.

A second defect in the undergraduate instruction at the University consists in the delegation of too large a part of the instruction to subordinate and inexperienced members of the faculty. The actual knowledge imparted to the student is only a small part of his medical training. At our conferences with the senior students and house officers, the universal complaint concerning the instruction in the primary branches, and to some degree in the clinical branches, was the absence of the heads of chairs in the class room, lecture room, and wards. Contact with wise men of inquiring minds, enriched by years of experience, is the element of chief value in the training of young men for the practice of medicine. The committee believes that this matter should receive serious consideration at the hands of the Dean of the school and its administrative board.

It is a matter for congratulation that the medical school has more applicants for its entering freshman class than can be accepted. A limit of ninety

men has been settled upon by the administration as the maximum number to be accepted. This policy gives an opportunity for a selection of unusually well qualified men to enter, but has the drawback of excluding many probably as worthy men who do not present as high credentials. The committee is of the opinion that every effort should be made to accept as large an entering class as possible, even though the efficiency of the instruction may suffer to some degree. No evidence was submitted to the committee to substantiate the criticism that the standards of admission to the medical school had been lowered or the qualifications for graduation had been in any way modified. Graduates of our school are given a thorough training and are fully qualified to engage in the practice of medicine.

The committee found that carelessness in attendance at lectures on the part of faculty members was a serious disturbing factor during the war and occasioned many student complaints, but this drawback to effective teaching should now be remedied.

Postgraduate Instruction

The development of postgraduate instruction at Rochester, under the Mayo Foundation, has moved forward so rapidly as to entirely overshadow the attempts made to develop this work upon the campus. The University has enrolled in 1920 sixteen fellows taking the three year course preparatory for various specialties, four fellows in the health service, and eighteen others taking various short courses. The training of the fellows in their specialties is handicapping the undergraduates instruction at the University, particularly in the clinical branches. The small amount of available clinical material does not justify the attempts which are being made to develop the work upon the campus untill larger hospital facilities are provided. The great clinical facilities offered in the city hospitals of Minneapolis and St. Paul, which could be made available for such instruction, remain almost entirely unutilized. Here is a most fruitful field in which to carry on this work. To relieve the burden upon the University Hospital, determined attempts should be made at once to acquire this material for postgraduate instruction, and the efforts of the alumni will be of great assistance to the school, in bringing this about.

The abandonment by the school of short postgraduate courses to practicing physicians the committee believes should be condemned. Such courses serve to keep physicians informed upon the new developments in practice, stimulate their interest in study and observation, and renew the ties that bind alumni to their alma mater. They should not be given in conjunction with undergraduate work. Next to undergraduate instruction, we feel that the practicing physicians of the state should receive first consideration at the hands of the medical school. It is a real need of the profession of this state. It outweighs in importance the instruction given in the specialties. With the abundant clinical facilities at hand in the twin cities, no good reason exists for the neglect on the part of the administration in developing to its fullest degree this type of instruction.

The Dean of the medical school has furnished the committee with information relative to the postgradate work at the Mayo Foundation. Of the one hundred and forty fellows doing work there, sixteen are graduates of Minnesota. Since the organization of the Mayo Foundation in 1916, six fellows from the Foundation have matriculated at the University for work, while three others have served interne services in the Hospital for Crippled and Deformed Children, at Phalen Park.

The information upon which this statement is based was furnished to the committee at its request by Dean Lyon, February 24th, 1920. In his letter of transmission Dean Lyon states that Dr. L. B. Wilson, Director of the Foundation, gave the information. Dr. Wilson has now transmitted to the committee a corrected student list brought down to September 30th, 1920, which will alter this statement to read as follows: "Of the one hundred and fifty-eight fellows doing work there, twenty-five are graduates of Minnesota. Since the organization of the Mayo Foundation in 1916, ten fellows from the Foundation have matriculated at the University for work, while three others have served interne services in the Hospital for Crippled and Deformed Children at Phalen Park."

The complete list of all Minnesota students, graduate and undergraduate, in the Mayo Foundation is reported by Dr. Wilson as follows:

Fellows—one hundred and fifty-eight, of which twenty-five are Minnesota graduates.

Special students—eighteen, of which two are Minnesota graduates.

Undergraduate students doing work during the 1920 vacation—eight.

Graduate students who have done work in the Foundation since 1916—seven.

Hospital Development

A rich hospital material containing all varieties of clinical cases in abundance is the foundation upon which successful medical teaching rests. This the medical school lacks and has failed to develop out of a most favorable situation. The University Hospital with its 240 beds and the University Dispensary with its 15,696 admissions a year do not begin to furnish sufficient clinical material. While the City Hospitals of St. Paul and Minneapolis are being utilized to a limited degree, the committee feels that more persistent and determined efforts should be made to develop the clinical facilities offered by these institutions, especially with relation to postgraduate teaching and instruction in the specialties.

In order to meet the need of greater hospital facilities, the administration has announced a policy whereby hospital expansion will be developed on the campus along the "per diem" and "pay patient"

lines. The "per diem" plan has already been put into effect and fifty beds in the University Hospital have been set aside for this purpose. These patients pay for their hospital care, but not for the professional services rendered. The "pay patient" plan, which includes pay for hospital care and also for professional services rendered by the medical and surgical staff, has not been put into operation, although preliminary steps have been taken looking toward its fulfillment. The profession of the state and the alumni of the medical school have repeatedly voiced their objection to the adoption of either the "per diem" or "pay patient" system upon the campus. The committee is of the opinion that hospital expansion should continue to be developed along charity lines, in harmony with the original plan as established at the time the Elliott Memorial Hospital was founded.

The committee wishes to call the attention of the Alumni to the wording of the legislative act accepting the Elliott gift, passed by the legislature February 8th, 1907, which reads as follows: Section 3. "That said Elliott Memorial Hospital building shall belong to and be a part of the University of Minnesota. It shall receive for *free care and treatment indigent* persons suffering from disease, who have resided in the state of Minnesota not less than six months".

The committee is, therefore, opposed to both the "per diem" and "pay patient" plan. There is urgent need for increased hospital facilities. The administration, is, we believe, hindering rather than helping the cause of hospital expansion by so persistently clinging to this method of increasing the clinical advantages of the school. Under the charity plan, with the loyal support of the profession and the alumni, financial help will come from sources not so readily available under the pay system.

The Dean of the medical school has informed the committee that a plan is now on foot to establish a psychiatric hospital to be erected on the campus by the State Board of Control, with some element of management left in their hands, while the feeding, care of patient, medical supervision and the like is to rest in the hands of the University. The committee favors the establishment of a psychiatric hospital upon the campus and recommends to the alumni that definite steps be taken to assist the school in obtaining this valuable clinical asset. The committee also favors the erection by the state of a pavilion, housing sixty patients, to serve as a clearing house for the study of persons suspected of having tuberculosis in its early stages and urges the alumni to support any movement which the Regents may make before the legislature to obtain this much needed institution for the medical school.

Administrative Head of the School

The medical school stands in an anomalous position relative to its administrative leadership. The Dean of the school is a skilled physiologist and not a physician, while the Dean of the postgraduate school was professor of history prior to his appointment to his present position. Both of these men stand in a position to receive advice and counsel from administrative boards composed of medical men, but, because of their lack of training as physicians, neither of these men possesses, nor can either develop that intimate knowledge of the need of the graduate in medicine, that sympathy with the ideals of the profession, that close touch with the physicians of the state required of men who assume such leadership. Some of the difficulties with which the medical school is now struggling undoubtedly arise from the fact that the heads of the undergraduate and the postgraduate schools are laymen and fail to grasp the viewpoint of the practicing physicians of the state. The committee does not believe that any medical school should possess as its Dean a man who has not been trained as a practicing physician. The committee is of the opinion that the direction and supervision of all the medical instruction, both undergraduate and graduate, should rest in the hands of the Dean of the medical school and that a man, trained in the ideals and traditions of the profession, possessing the qualities of leadership capable of harmonizing the interests of the profession and the alumni with the medical school, should be appointed as Dean.

Alumni and the Medical School

No medical school can continue to exist and perform its proper function in the state divorced from its alumni body. In the sympathetic support, good will and loyalty of its graduates lies a potent force little appreciated until lost and, when lost, difficult to regain. The committee finds that the medical school stands today isolated from its alumni and out of touch with the alumni association. For the past four years, neither the alumni association, nor its advisory committee, nor any of its officers has been asked by the administration to express their judgment relative to the educational policies of the school, or consulted concerning its interests. This course of action is contrary to all the traditions of the school and the customs of the past. A course thus pursued by the administration continues to breed inertia and disinterestedness. This committee believes that our alumni are interested in and loyal to the school and are ready to rally to its support when called upon to render service. Difference of opinion will exist, but respectful hearing of the authorized alumni body upon matters of large import to the school should be sought by the administration and given due weight in formulating its educational policies.

The high obligation imposed by the alumni in authorizing this study of conditions in the medical school has not for one moment been lost sight of by the committee. The affection which alumni, trained under Cyrus Northrup, bear toward the University commands that such a task be approached with sympathy for those engaged in so difficult an

educational undertaking, reverence for the good name of the school, honesty of purpose, and a high resolve to be of service to the institution. Entrusted with an important work, the committee has gone about it in a careful, painstaking manner. Every effort has been made from official, faculty and student source to secure the knowledge required in order to present to the alumni a report worthy of consideration. The various conferences with the President of the University, the Dean and Secretary of the Medical School, the Superintendent of the University Hospital, various members of the faculty, recent graduates, and the student body have consumed a large amount of time and required a real sacrifice upon the part of the members of the committee. The courtesy and consideration shown the committee by those interviewed, including the President of the University and the Dean of the Medical School, is hereby gratefully acknowledged.

A factor which hindered materially the work of the committee was the apparent lack of open frankness of expression and free discussion upon the part of many members of the medical faculty. The resolution restricting academic freedom, passed four years ago by the Board of Regents and still in force, is we believe responsible for this. The committee would recommend that this association pass a resolution asking the Board of Regents to rescind its action relative to the academic freedom of the medical faculty and permit free discussion of all matters pertaining to the educational policy of the medical school.

Earle R. Hare,
John E. Hynes,
Frederick A. Erb,
Peder A. Hoff,
George D. Head, Chairman.

OF GENERAL INTEREST

Dr. L. E. Claydon sailed October first for Europe where he will remain several months.

Dr. C. J. Hutchinson of Minneapolis has joined the Mayo Clinic in Dr. Plummer's section.

Dr. J. Lepak, St. Paul, was married to Miss C. Rosenthal of St. Paul on October 18th.

Dr. Harry B. Zimmermann, St. Paul was married on October 16th to Miss Mary Prince of St. Paul.

Dr. Herbert Sawyer of Goodhue was married to Miss Minora Backman of Goodhue on October 10th.

Dr. Paul D. Berrisford, St. Paul, was married on October 30th to Miss Mary Geraldine Kilty of Stillwater.

Dr. J. Fletcher Robertson, formerly a member of the staff of the Mayo Clinic, is now visiting in Rochester.

Dr. M. C. Bergheim a recent graduate of the Medical College of the University of Minnesota will locate in Raymond.

Kinney, Minnesota, is without a physician. The Commercial Club of Kinney would be glad to answer any inquiries.

Dr. G. L. Jacquot of Ivanhoe will move to Tyler where he will specialize in diseases of the eye, ear, nose and throat.

The American-Scandinavian Foundation has sent Dr. N. A. Nielson, of Copenhagen, to the Mayo Foundation for special work.

Dr. F. A. Engstrom of Wanamingo will move to Red Wing where he will become associated with Drs. L. E. Claydon and M. H. Cremer.

Dr. Louis Manuel de Baylé has been commissioned by the government of Nicaragua to do graduate work in medicine in the Mayo Foundation.

Dr. Robert Emmett Farr will give a paper on Local Anesthesia before the State Meeting of the American College of Surgeons at Buffalo on December 2nd.

Dr. C. W. Kanne who has been located at Arlington for twenty years will locate in Faribault. Dr. J. S. Farrell of Green Isle will move to Arlington.

Dr. James McKeon, who has been a physician at Montgomery for thirty years has removed to St. Paul. His son has taken over his practice at Montgomery.

A physician is wanted at Marine on St. Croix. Any one interested may write to Mr. R. E. Strand, Secretary, Commercial Club, Marine on St. Croix, Minnesota.

Dr. Sistrunk of Rochester recently read papers before the Pennsylvania State Medical Association and the Oswego County Medical Association in Oswego, N. Y.

Dr. Archie McCallister of Red Lake received a decoration from the Russian Government for his work while he was in charge of the American Red Cross Public Health work in their fight against the typhus epidemic in Russia.

Dr. Arthur A. Wohlrabe has severed his connection with the Mankato Clinic and has associated himself with Dr. Hugh Willson and Dr. Verne S. Cabot. The office of the new firm is located at 327 La Salle Building, Minneapolis.

Dr. Gaston Labat, of Paris, delivered a series of lectures on regional anesthesia and nerve blocking at the Mayo Clinic during October. Dr. Labat came on the invitation of Dr. C. H. Mayo, who was much impressed with his work with Pauchet in Paris.

The Mayo Foundation lectures for Dec. 2 and 16th will be: Dr. H. W. Orr, Lincoln, Neb. "The Treatment of Spinal Injuries" and Dr. C. M. Jackson, Minneapolis, "History of Anatomy". The lectures are given at 8:00 P. M. in the Assembly Room, Mayo Clinic Building, Rochester.

A new clinic will be located in the building now being erected on the corner of Nicollet and 10th street, Minneapolis. The members of the clinic will be Drs. Baldwin, Carey, Clark, Condit, Hanson, Haynes, Johnson, Litzenberg, MacGibbon, Morrison, Murray, Reed, Schaaf, Schneider, Strachauer, Thomas and White.

The many friends of Dr. John Fulton of St. Paul will be pleased to learn of the winning of a Rhodes

Scholarship by John Fulton, Jr. After a year at the University of Minnesota, John Fulton, Jr. entered Harvard, where he has since been except for the time he spent in the Marine Corps. He spent the summers of 1919 and 1920 with the Harvard Unit at the Bermuda Biological Station for Research and last June won both first and second Bowdoin prizes for essays on biological and physiological subjects. He expects to take his degree at Harvard in June and spend the next three years at Magdalene College, Oxford. He will study for his M. D. at Harvard upon his return.

The Physicians and Hospitals Supply Company of Minneapolis has been recently incorporated and will take the place of the Standard Medical Supply Company. It will take up a new location at 413 Sixth Street, where its manufacturing equipment and stocks will be more conveniently located for the local trade. Mr. G. W. Olson, superintendent of the Swedish Hospital, Minneapolis, will direct the new policy of this new concern, as manager.

The Charles T. Miller Hospital, St. Paul, will open on December first. The building has just been finished and incorporates the latest ideas in hospital construction. Dr. L. B. Baldwin, for many years superintendent of the University Hospital is superintendent.

The hospital is a general hospital of 216 beds and will accommodate all types of cases except contageous and insane. There are 78 private rooms, the rest of the beds being in 2, 4 and 6 bed wards. Fifty free beds will be available for charity cases.

The medical staff is as follows: Drs. Harry B. Zimmermann, Egil Boeckmann, Arthur E. Mark, John M. Armstrong, Charles D. Freeman, Paul B. Cook, A. R. Hall, Edgar T. Herrmann, J. S. Gilfillian, Ernest T. F. Richards, Louis E. Daugherty, A. C. Heath, William Davis, Herbert Davis, Harry J. O'Brien, G. E. Senkler, Charles L. Greene, James T. Christison, Walter R. Ramsey, J. L. Rothrock, C. Eugene Riggs, J. Felton Hammond, Eduard Boeckmann, Frank E. Burch, E. R. Bray, Warren A. Dennis, Archibald MacLaren, Harry P. Ritchie, Ernest M. Hammes, A. W. Hilger, John T. Rogers, Arthur Sweeney, John L. Shellman, W. W. Lewis, John C. Staley, Charles E. Connor, Wallace Cole.

University Public Health Nursing Course.—The second course in Public Health Nursing will begin January 4th, 1921 and will continue four months. New students may be admitted at this time or those who have taken the first four months' training may continue their studies through the second period. A four years' high school course is a prerequisite for admission. Applicants may be graduates of recognized schools of nursing or senior students in such schools who are recommended by the superintendent in charge.

Applications for entrance should be made, as soon as possible, to Miss Louise M. Powell, Superintendent, School of Nursing, University of Minnesota, Minneapolis.

OBITUARY

DR. ALONZO P. WILLIAMS

Dr. Alonzo P. Williams died October 22, 1920 at his home in Santa Monica, California, at the age of 66 years. Dr. Williams practiced in Minneapolis twelve years ago. He specialized in nervous diseases and had an office in the Pillsbury Building. Besides his wife, he is survived by a son and daughter, one brother and two sisters.

DR. CHARLES K. ROYS

Dr. Charles K. Roys died at Rochester in September at the age of 44 years. After his graduation from the College of Physicians and Surgeons in 1901, Dr. Roys was house surgeon at Presbyterian hospital in New York. He sailed several years later for China to do medical missionary work and had charge of the hospital at Weishien, Shantung for twelve years. Later Dr. Roys was decorated by the emperor of China for services rendered. In 1916 the board of directors of the College of Medicine of the Shantung University invited Dr. Roys to become head of the anatomical department. Several years later he took up special research work in the United States for the Rockefeller Foundation. His widow survives him.

DR. E. J. BATCHELDER

Dr. E. J. Batchelder, assistant in pediatrics in the Medical College at the University of Minnesota and specialist in diseases of children, died, at the age of 54, in September at the Abbott Hospital, Minneapolis, following an illness of less than a week. Dr. Batchelder was born in Stillwater. He practiced in Southern Minnesota until two years ago when he came to Minneapolis. His is survived by his widow and two daughters.

DR. J. C. HVOSLEF

Dr. J. C. Hvoslef died on October 11th at his home in Lanesboro. He was born in Norway, August 24th, 1839. He graduated from the University of Norway at Christiania, later continuing his studies at Rush Medical College in Chicago. In 1876 he came to Lanesboro which ever since has been his home. In 1879 he was married to Miss Karen Anderson, who survives him. He is also survived by a brother, Jens Hvoslef, a Norwegian state official and a sister, Mrs. Thorvald Klavanae, both of Christiania, Norway.

DR. J. HARLAN STUART

Dr. J. Harlan Stuart was born in North Carolina in 1836. He came of a long line of Quaker ancestry. After completing his studies in Friends School, North Carolina, he graduated from Haverford College, near Philadelphia. Just before the War of the Rebellion, being opposed to slavery, he with many other Quakers emigrated to Indiana.

He studied medicine and graduated from Bellevue,

N. Y. in 1867, locating first in Indiana and later, in Lawrence, Kansas. In 1882 he came to Minneapolis where he engaged in general practice up to 1903.

After the discovery of Roentgen he became much interested in x-ray work and after a course in New York in this line, he devoted his time exclusively to this work, being the first in Minnapolis to do so. This he continued until about a year before his death, going to his office daily though over 80 years of age. He never lost his enthusiasm for this work and during his last illness frequently dwelt on the efficacy of this agent in the treatment of disease.

His influence on the medical profession of Minneapolis was always exerted in the furtherance of good feeling and ethics, and he was one of the first to advocate noon-day meetings of the local profession, saying that, aside from the knowledge gained from the papers and discussions, it was a great benefit to get to know each other in a social way.

He was a man of broad views in religion and frequently spoke in Friends' meetings. His whole life exemplified his abounding faith in the hereafter and realizing his end was near said "I am in the valley of the shadow of death and am not afraid." He was a genial friend and companion and keenly appreciated a joke, provided it was clean and decent.

In general practice he made many warm friends, for he was confidant and advisor as well as physician.

He could truly say at the end of a long and useful life, "I have fought the good fight, I have finished the course, I have kept the faith."

WANT AD DEPARTMENT

Courses in Nursing offered at Nopeming Sanatorium (capacity 200 patients.) 1. *One year of hospital training* open to applicants who have completed one year or more of high school and are over 18 years of age. 2. *Two year course in tuberculosis nursing.* 3. *Three months course* in tuberculosis nursing *for undergraduates* in training *in general hospitals.* 4. *Three months course* in tuberculosis nursing and field work *for public health nurses.* Wages are paid during training. The work is interesting and safe. A beautiful new nurses home containing 36 single rooms has just been completed. Address Carrie E. Eppley. R. N. Supt. of Nurses, Nopeming, Minn.

Wanted—M. D. to share office space with dentist. 300 Phy. Surg. Bldg. Ready for occupancy Dec. 1st. XYZ, Minnesota Medicine.

WANTED—Doctor in Minnesota village of 500, 30 miles from Twin Cities. Nearest competition 12 miles. Four other towns are within territory without doctor. Good roads and good collections. Scandinavian locality.

Commercial Committee, Town and Country Club, Marine on St. Croix, Minn.

BOOK REVIEWS

CARE AND FEEDING OF INFANTS AND CHILDREN. By Walter Reeve Ramsey, M. D. Second Edition. J. B. Lippincott Co., Philadelphia, Pa. $2.50.

This is the second edition of the book. It is designed for nurses and serves not only as a text book but is also a practical book for every day use. Subjects including physiology and anatomy of the child, feeding of infants and the pathological conditions of infants and children are well presented and make the book of distinct value.

The first chapter, Child Welfare, has been rewritten. The field of child welfare is divided into five periods. (1) Prenatal, (2) Natal, (3) Postnatal, (4) Pre-school age, and (5) School age.

Because of the large field the author recommends that the nurse having obtained a fair grasp of the entire subject, specialize in some certain phase of the work.

The chapters on feeding are especially helpful.

The book contains 279 pages, is written concisely and should be of interest to every nurse.

K. Nye.

COLLOIDS IN BIOLOGY AND MEDICINE. By Bechhold, Translated by J. G. M. Bullowa; D. Van Nostrand Co., New York, 1919.

This is a translation of the second addition of Bechhold's stimulating volumn.

We have here a bold yet clear application to biology of the chemical facts elicited in colloidal research work. A perusal of this volumn will enable the reader to group more easily the why and the wherefore of many puzzling physiological and pathological phenomena. After all it would seem that life depends upon a few simple laws of colloidal chemistry.

The subject matter is classified systematically and arranged conveniently. A general review is presented; unexplored gaps are indicated, and cumbersome detail is omitted.

Part I. presents a brief introduction to the study of colloids. Sols, gels, surfaces, the physics of motion and the physical properties of colloids are defined, one chapter being devoted to methods of colloid research.

Part II deals with the biocolloids and presents colloid-chemically the following: carbohydrates, lipoids, proteins, food and condiments, enzymes, and immunity reactions.

Part III shows how the organized system is constructed from colloid fragments. Metabolism, growth, movement, circulation, respiration, secretion, excretion, internal secretions and the nervous impulses are explained from the colloid view point.

The concluding chapters deal with colloids in toxicology, pharmacology and histologic technic.

Ignatius J. Murphy.

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Minnesota State Medicine Association

ANNUAL MEETING

September 29, 30 and October 1, 1920

ST. PAUL, MINNESOTA

MINNESOTA STATE MEDICAL ASSOCIATION
MINUTES OF THE FIFTY-SECOND ANNUAL
MEETING HELD AT ST. PAUL,
SEPTEMBER 29, 30 and
OCTOBER 1, 1920

PROCEEDINGS OF THE HOUSE DELEGATES

FIRST SESSION—WEDNESDAY, SEPTEMBER 29, 1920

The House of Delegates of the fifty-second annual meeting of the Minnesota State Medical Association was called to order in the Windsor Room of the St. Paul Hotel at 2:10 P. M., by the President, Dr. J. H. Adair, Owatonna, who said: The first order of business is the appointment of the committee on credentials. This does not need a formal motion, I believe. The President will appoint Dr. W. H. Magie, Duluth, Dr. E. W. Buckley, St. Paul, and Dr. M. L. Mayland, Faribault.

DR. MAGIE: Mr. President: I am not eligible to serve on this committee as I am not a member of the House of Delegates.

PRESIDENT: If that is the case, I will appoint Dr. W. L. Beebe, St. Cloud. The Committee on Credentials can proceed with their work and we will take up other matters while we await their report.

DR. R. J. HILL, Minneapolis: Mr. President: In relation to the House of Delegates I wish to say that Dr. Farr has two suits of clothes and left his credentials in his other suit (laughter). I know that he has these credentials and I move you that he be seated at this time.

THE PRESIDENT: Do I hear a second?

THE SECRETARY: I second the motion and there should be included the name of Dr. J. J. Catlin, Buffalo, for whom I can vouch.

DR. H. M. WORKMAN: The same should be done for Dr. E. T. Sanderson, Minnesota, for whom I can vouch.

THE PRESIDENT: Before I put this motion I will say that it strikes the Chairman as very suspicious in the case of Dr. Farr, because it is the first time in my experience that any doctor has been known to have more than one suit of clothes (laughter). However, as many as are in favor of seating these delegates will manifest it by saying aye.

Motion voted and unanimously carried.

THE PRESIDENT: While the Committee on Credentials are preparing their report we will, if there is no objection, proceed to the next order of business, which is the reading of the minutes of the last meeting, by the Secretary.

THE SECRETARY: Mr. President: The minutes of the last meeting were printed in full in the December, 1919 number of Minnesota Medicine. Is it the desire of the delegates to hear them read at this time?

DR. J. T. CHRISTISON: I move that the minutes be accepted as printed.

Motion seconded and carried.

THE PRESIDENT: The next order of business is the report of the President of the Councilors.

DR. R. J. Hill: The Councilors had one or two special meetings during the year, I think, considering the action of the Brown-Redwood County Medical Society, the reports of which have been sent in and I will ask that the Secretary read our findings in the matter. Also at to-day's Council meeting several recommendations were made to the House of Delegates, which the Secretary will also read.

THE PRESIDENT: Are you ready to read the report now, Mr. Secretary?

THE SECRETARY: I believe the portion of these minutes which Dr. Hill desires to have you know is simply the fact that the Brown-Redwood County Medical Society was under discussion and it was decided by the Council that a new charter be granted this reorganized society if the attorneys for the Association reported that there were no legal obstacles to the granting of such charter. The attorneys, after careful investigation of the situation, reported that it was their judgment that a charter should be issued. The charter is now ready for issue when it is ordered by the House of Delegates.

The recommendations of the Council at its meeting today are couched in two recommendations. A motion was made and carried that we recommend that the House of Delegates grant a charter to the newly reorganized Brown-Redwood County Society.

Second, that Jackson County be added to the Southwestern Minnesota Medical Society, inasmuch as Jackson a year ago, by unanimous vote, asked that they be permitted to surrender their charter and join the Southwestern, or some contiguous society, because of the difficulties they had in conducting their

own meetings on account of having so few members.

The Council makes both of these recommendations to the House of Delegates. There was a third recommendation, that a per capita tax of two dollars per annum be credited to Minnesota Medicine, beginning October 1st, 1920.

THE PRESIDENT: The report of the Council is now before the House of Delegates for disposal. What will you do with it? A motion to adopt it *in toto* or to adopt the recommendations singly will be in order.

DR. R. J. HILL: Take them up singly, Mr. President.

DR. E. M. Clay: I move you that the first two recommendations be adopted by this House of Delegates. Seconded by Dr. F. R. Weiser.

DR. R. J. HILL: The House is not yet organized, so I think all we can do is to receive the report and act on the recommendations afterwards.

DR. J. T. CHRISTISON: I move that the report be received and referred to the House of Delegates after its organization. Seconded and so ordered.

THE PRESIDENT: Next is the report of the Secretary.

THE SECRETARY: (Read the following report):

REPORT OF THE SECRETARY

The Minnesota State Medical Association has now reached its fifty-second milestone, and we are today celebrating our fifty-second annual meeting.

So far as the Secretary is informed, there is now but one Charter member living, Dr. A. W. Daniels of Pomona, California, whom the association elected to honorary membership at its session one year ago.

This has been a year of readjustment. Following their return from service in the army, many of our members have changed their locations and there has been a considerable movement to the larger centers of population. At our last annual session, one of our component societies had its charter revoked, a second society surrendered its charter in order to join a larger component society. During the year a charter has been granted to the reorganized Brown Redwood Society, so that our component societies now number thirty-seven instead of thirty- eight as a year ago. Our membership remains almost stationary. We have at this time fifteen hundred and forthy-eight members, five of whom are still reported in the service of the United States army.

During the year, a goodly number of suits for malpractice have been filed against our members. Some cases have been dismissed, and every case tried has been successfully defended, a record of which we may be proud. There are now a number of cases pending as shown by the report of our attorneys.

Our membership by component societies is as follows:

	Members
Aitkin County	4
Blue Earth County	30
Blue Earth Valley	25
Brown-Redwood	14
Camp Release District	49
Carlton County	7
Central Minnesota	12
Chisago-Pine	15
Clay-Becker	25
Dodge County	8
Freeborn County	11
Goodhue County	14
Hennepin County	359
Houston-Fillmore	29
Kandiyohi-Swift	14
Lyon-Lincoln	14
McLeod County	11
Meeker County	10
Mower County	25
Nicollet-LeSueur	17
Olmstead County	82
Park Region District	37
Ramsey County	250
Red River Valley	49
Rice County	22
St. Louis County	117
Scott Carver	15
Southwestern	50
Stearns-Benton	40
Steele County	14
Upper Mississippi	75
Wabasha County	12
Waseca County	10
Washington County	13
Watonwan County	8
West Central	19
Winona County	24
Wright County	13
	1543
Roll of Honor	5
Total	1548

The Secretary reports receipts from component societies from

Oct. 1st. to Dec. 31st., 1919	$ 115.00
Jan. 1st. to Sept. 20, 1920	6,172.00
Back dues	8.00
making a total of	$6,295.00

remitted to the Treasurer. Owing to greatly advanced prices in all commodities, it is recommended that the annual dues of our state association be advanced to five dollars per year, and that the per capita tax for Minnesota Medicine be raised to two dollars per year. The advisability of this recommendation should appeal to every member of the state association.

The writer is convinced that our state association is missing many opportunities for service to the state at large. Our activities should be continuous throughout the year. Some system of graduate work for our members should be established whereby they could receive the benefits at their own homes without the necessity of going to the medical centers at too frequent periods.

Many problems of our state association remain unsolved because there is no one to attend to them. If we are to receive the maximum benefit from this association, there should be some one whose sole business it is to solve these problems as they arise. In order that this might be accomplished, the Secretary recommends first, that a secretary be elected from our membership whose duty it shall be to supervise the work, second, that an executive secretary be elected, but not a professional man, whose duty it shall be to carry on the executive work of the office of Secretary.

It is desirable to call to the attention of this House of Delegates a movement toward the socialization of the practice of medicine. There was recently introduced in the legislature of the State of New York the "Health Centers Bill", the purpose of which is to establish health centers in various portions of the state to be under the direct control of a health board, to which unlimited power is given. This bill is soon to be introduced into the legislature of the State of Illinois, and it will require an active educational campaign to prevent its being enacted into law. Every member of the medical profession should be aware of these movements and prepared to meet them as they arise.

Your Secretary desires once more to impress upon

each delegate of every component society, the necessity of making an active effort during the coming year, to secure for membership every eligible physician within its jurisdiction, and in this way bring our Association to the highest degree of efficiency.

Respectfully Submitted,

EARLE R. HARE, Secretary,

730 La Salle Building, Minneapolis.

September 29th, 1920.

THE PRESIDENT: You have heard the report of the Secretary. What will you do with it?

DR. H. M. WORKMAN: I move that the report be accepted. Seconded and carried.

THE PRESIDENT: We will now listen to the report of the Treasurer, Dr. Beckley.

DR. F. L. BECKLEY presented the following report of the Treasurer:

MINNESOTA STATE MEDICAL ASSOCIATION

Annual statement of the Treasurer covering period—
October 1, 1919, to September 20, 1920

RECEIPTS

Minnesota Medicine	$ 8,399.73
Dr. E. R. Hare, Sec'y dues	6,295.00
Interest-bonds and balances	221.50
Bonds	4,000.00
Cash on hand Oct. 1, 1919	3,630.73
	$22,546.96

DISBURSEMENTS

Minnesota Medicine	9,174.69
Dr. E. R. Hare, Office Exp.	655.20
Salaries	888.85
Legal Expense	2,148.38
Bonds	4,000.00
Sundries	3,244.42
Cash on hand Sept. 20, 1920	3,366.63
	$23,478.17
Vouchers not in	931.21
	$22,546.96

F. L. BECKLEY, Treasurer.

THE PRESIDENT: You have heard the report of the Treasurer, what is your pleasure regarding it?

DR. F. R. WEISER: I move that it be accepted. Seconded by Dr. Hynes and carried.

THE SECRETARY: Mr. President, it may be wise to make the statement at this time that the records of the Secretary, the Treasurer, and Minnesota Medicine have been gone over by the auditing committee of the Council and all approved. I think there is no provision made for a report from the Auditing Committee here.

THE PRESIDENT: The next order of business is the report of the Attorneys of the Association.

THE SECRETARY: I have the following report received from Messrs. Moore, Oppenheimer and Peterson, the Attorneys for the Association.

Earle R. Hare, M. D.,
Secretary,
Minnesota State Medical Association,
Dear Sir:

We beg leave to report as follows, relative to the work done by us from October 1st, 1919, to date, on behalf of the Minnesota State Medical Association:

Demarais vs. Norman: Case originally brought in Polk County, Minnesota, District Court for $6,000 damages on account of alleged malpractice in reducing and caring for a compound fracture of the left tibia and fibula. Since our reports to you of April 1st and September 26th, 1919, the case was set for trial on June 28 and on that day was dismissed in open court on the merits and with prejudice to the bringing of another action. Report made to you on June 29th, 1920.

Brehmer vs. Utley: No further developments since our reports to you of August 3, 1918, and September 26, 1919.

King vs. Eshelby: Suit for malpractice pending in Ramsey County, at the time of our report to you of September 26th, last. The case was set for January 7th last, and was dismissed by the plaintiff without prejudice, as per our report to you of January 7th, 1920.

Crol vs. Nye: Since our last report to you of September 26th, 1919, this case was set down for trial, and on January 8th last, was dismissed without prejudice. We reported to you on that day.

Dennis, Gilfillan & Staley vs. Andersons. In our report to you of September 26th, 1919, we advised that depositions were being taken. Since that time, and on March 4, 1920, judgment was entered in favor of the plaintiffs. Defendant's Counterclaim for alleged malpractice was dismissed.

Ernest Gabbard vs. Dr. Robert S. Brown: This case was set for trial on June 9th, and before trial and on June 2nd the case was formally dismissed, and report made to you on that day.

Fannie Gabbard vs. Dr. Robert S. Brown. This was an action for alleged malpractice in using hypodermic needle; that of the husband *Ernest Gabbard* for loss of services of his wife, Fannie Gabbard. This case was set for trial on June 9th and the same was dismissed on June 2nd last; report made you that day.

Flora Woodruff vs. Dr. T. C. Clark: Since our report to you of September 26th, 1919, this case was dismissed by the plaintiff in open court on May 9th last. Report was made to you thereof on May 10th last.

Carl A. Youngren vs. Dr. W. Z. Flowers: Suit brought in Ramsey County District Court for alleged malpratice in the care or treatment of a compound comminuted fracture in the ankle of plaintiff's left foot. Pleadings have all been served and the case is at issue, but was not reached for trial when the Court adjourned for its summer vacation.

(a) *Pearl Singer vs. Dr. O. N. Bossingham*: Action in District Court of Lincoln County, Minnesota, to recover $16,000 account of alleged malpractice of defendant in the care of plaintiff in childbirth:)

(b) *Gustave Kruger vs. Dr. O. N. Bossingham*:) Action in same Court to recover $5,000 for) loss of services and expenses by reason of al-) leged malpractice of defendant in caring for) Rosie Kruger, the wife of Gustave Kruger,) in childbirth:

(c) *Gustave Kruger as Administrator of Estate*) *of Rosie Kruger vs. Dr. O. N. Bossingham*:) Action in same Court to recover $15,000 on) account of alleged wrongful death of Rosie) Kruger caused by alleged negligence of de-) fendant in the care of Rosie in chirdbirth:)

All pleadings were served and case was on for trial at Ivanhoe, Minnesota (each suit); we appeared in Court and the cases were dismissed. Report was made to you on March 25th last, and cases were dismissed on March 19th last.

A new action has been commenced in the same Court by Pearl Singer against Dr. O. N. Bossingham; the pleadings have all been filed, and the case set for trial at the September General Term, and at this writing is now on trial.

A new action has been commenced in the same Court by Gustave Kruger, as Administrator of the Estate of Rosie Kruger, deceased, against Dr. O. N. Bossingham; the pleadings have all been filed, and

the case set for trial at the September General Term, and at this writing is now on trial.

Mabel R. Nelson vs. Dr. O. O. Larson: Action brought in District Court of Becker County, Minnesota, to recover $10,000 on account of alleged malpractice of defendant in the treatment of a comminuted fracture of the tibia and fibula of plaintiff's right leg. The case was on for trial at the April term of Court, and we were engaged in the trial of the case six days. A verdict was directed in favor of Dr. Larson on April 7th last.

E. D. Miner vs. Dr. G. M. Helland: Action brought in Houston County, Minnesota, District Court; Dr. Helland's attorneys prepared the pleadings and made a motion to have Dr. M. S. Nelson, of Spring Grove, Minn., made a party defendant; motion was granted and Dr. Nelson made a party to the suit. The case is on for the December, 1920, Term of Court at Winona.

Dr. Edward I. Brown vs. Mrs. T. A. Shirley: Action brought to recover fees for professional services. Defendant interposed counterclaim charging malpractice, on plaintiff's part, in performing an hysterectomy on September 25th, 1919. On May 25th last we obtained a dismissal of the malpractice charge, and agreement for settlement of plaintiff's bill was reached.

Drs. J. S. Kilbride and L. J. Holmberg, Co-partners as *Kilbride and Holmberg vs. Bertha Beecher*: Action brought in Municipal Court of Yellow Medicine County, Minnesota, for fees and medical goods furnished. Defendant interposed a counterclaim charging malpractice on plaintiff's part, in applying excessive heat to defendant's right heel, causing a running sore. All pleadings are filed, and the case is on for the Jaunary, 1921, term of court.

Respectfully submitted,
MOORE, OPPENHEIMER & PETERSON.
Per M.

THE PRESIDENT: You have heard the report of the attorneys of the association. What will you do with it?

DR. E. M. CLAY: I move that the report be accepted. Seconded by Dr. F. R. Weiser and carried.

THE PRESIDENT: We will next listen to the report of the delegate to the A. M. A., Dr. W. H. Magie.

DR. W. H. MAGIE: I have gone over the full report and have culled from it a short abstract of the principal things of interest.

TO THE HOUSE OF DELEGATES MINNESOTA STATE MEDICAL ASSOCIATION

In response to a custom demanded by the House of Delegates of the Minnesota State Medical Association that the delegates representing this association in the House of Delegates at the American Medical Association are required to make a short report of the last meeting of the House of Delegates of the American Medical Association.

This meeting, as you know, was held in New Orleans, La. The first meeting of the House of Delegates convened in the assembly hall of Orleans Parish Medical Society Building, New Orleans, and was presided over by the speaker, Dr. Hubert Work of Puebelo, Colo.

The meeting was called to order Monday, April 26, 1920, at 10 o'clock a. m.

We first listened to the preliminary report of the committee on credentials by its chairman, Dr. H. B. Gibby of Pennsylvania, in which he stated that 53 delegates had registered and were entitled to seats in the House of Delegates.

After some routine business had been disposed of, Dr. J. Vaucken of Belgium, was introduced and made a short speech, thanking the delegates for the kind reception they had extended him while in New Orleans.

Then we next listened to a very able address by the speaker, Dr. Hubert Work. In this address he strongly advocated a Department of Public Health, headed by a medical cabinet officer. Universal military training was advocated; the principal argument was that inasmuch as 35 per cent of the drafted men that presented themselves for medical examination, were disqualified for army service on account of physical defects, they were also largely disqualified for efficient citizenship. The opportunity afforded for correction of many of these defects was great and the advantage gained to the nation would more than offset the cost entailed by the training of these young men.

MEMBERSHIP

The report on membership of this association says that membership of the various constituent state associations which is the membership of this association is 83,338.

FELLOWSHIP

The Fellowship of the Association on April 1, 1920, was 47,045 an increase over preceding year of 1,663.

DEATHS DURING YEAR

During the year two of the officers of the association has died. Dr. Emery Marvel of Atlantic City, N. J., who was second vice president, and Dr. E. E. Southard, Cambridge, Mass., chairman Section Nervous Diseases.

The president, Dr. Alexander Lambert, delivered an address, in which he dwelt upon influence and value of hospitals as institutions and the good work that is going on in the effort to increase the efficiency of hospital practice by standardization inagurated by the American College of Surgeons some years ago at a conference held in Chicago in which every State of the Union, except Alabama, was represented.

The following is from report of council on Medical Education: "Hospitals, generally, are taking the common sense view, that the survey is a part of a large movement for hospital betterment. They see that hospital standardization is an inevitable process, and that they will soon be expected to measure up to certain standards of equipment, organization and practice. Many of them strive promptly to effect the improvements in organization and in service necessary to secure and retain a Class A rating.

(k) The improving of hospital service is now one of the most important works confronting the medical profession. It is a work in which, naturally, physicians are most largely concerned. The American Medical Association, therefore, should take an active part in this work.

(l) The work of the association in connection with hospitals has rapidly grown since 1903. Under the Council on Medical Education there is now a Bureau on Hospitals with a man who devotes his entire time to the work. With the rapidly increased interest in hospital development during the last few years the work has been correspondingly extended.

(m) Besides the collecting of hospital information each biennium for the American Medical Directory, more elaborate surveys of all hospitals were made in 1912-14, and in 1915-16. A third extensive survey is now in progress.

(n) An advisory committee on hospitals to cooperate with the council has been appointed by every state medical association. These committees are doing splendid work and several have undertaken the personal inspection of all hospitals in their states.

(o) The association should continue to (a) conduct a clearing house of hospital information; (b)

further develop the Hospital Service Department in The Journal; (c) perpetuate its indexes and classifications; (d) inspect hospitals where satisfactory information is not otherwise obtained; (e) create permanent hospital committees in all states; (f) develop closer relationship with individual hospitals; (g) co-operate with other agencies working for better hospital service.

(p) An organization known as the American Conference on Hospital Service has been created at the suggestion of the Council on Medical Education in which the various agencies interested in hospitals are represented. The first meeting was held at the American Medical Association headquarters, Chicago, April 21, 1919. Subsequent meetings for the completion of organization were held in Cincinnati, September, 9-10, 1919, and again in Chicago, March 3-4, 1920.

THE REPORT OF COMMITTEE ON NARCOTIC DRUG SITUATION

This report was a very exhaustive one and cannot have much space in a report of this kind. I will state, however, that it was thoroughly discussed by men who had made an exhaustive study of the subject. It will suffice for the purpose of this report to state the recommendations adopted by the committee, which are as follows:

(1) That the ambulatory treatment of drug addiction as far as it relates to prescribing and dispensing of narcotic drugs to addicts for self-administration at their convenience , be emphatically condemned.

(2) That heroin be eliminated from all medical preparations, and not be administered, prescribed or dispensed; that the importation, manufacture and sale of heroin should be prohibited in the United States.

(3) That the bills introduced by Senator France, No. 2785, and Representative Rainey, No. 11778, to provide aid from the United States for the several states, in the prevention and control of drug addiction and the care and treatment of drug addicts be approved and that Senator France and Representative Rainey be so notified.

(4) In view of a statement in a government report that about 90 per cent of narcotic drugs entered for consumption is used for other than medicinal purposes, the treasury department is respectfully urged to continue to study and report on the narcotic drug situation including the question of government control of these drugs.

(5) That the Bureau of Public Health Service of the Treasury Department be respectfully requested to continue the compilation relating to habit forming drugs.

Resolutions on medical and surgical history of war was passed asking Congress for an appropriation of $150,000 to publish a medical and surgical history of the part played by the United States in the World war. This appropriation has been approved by the chief of staff and secretary of war and is now in the hands of the proper committee in Congress as part of the Sundry Civil Bill.

REMARKS BY PRESIDENT ELECT BRAIDSTED

Monday afternoon, April 29th, the House of Delegates was addressed by President Elect Braidsted in which he very modestly attributed his election to the office of president, to the desire of the association, to pay tribute to the splendid work done in the World war by the navy and not a personal compliment to himself. He laid stress upon the statement that he was here to work with us as a practicing physician and not as surgeon general of the navy and asked for a harmonious cooperation of all the members in order that the best results may be obtained from their labors.

PLACE OF 1921 SESSION

The board of trustees unanimously recommended Boston as the next place of meeting, whose recommendation was adopted by the House of Delegates.

After a rising vote of appreciation of the hospitality extended the association by the ladies as well as the medical profession and hospitable citizens of New Orleans, the house adjourned.

The above is respectfully submitted for your consideration.

W. H. MAGIE.

THE PRESIDENT: You have heard the report of the delegate to the A. M. A. What is your pleasure in reference to it?

DR. R. J. HILL: I move its acceptance. Seconded by Dr. H. M. Workman; carried.

THE PRESIDENT: Is the Committee on Credentials ready to report?

DR. E. W. BUCKLEY: Dr. Beebe has asked me to read the following report:

The house is entitled to seat fifty-three members; in addition the president, secretary and treasurer and eight members of the council, who are ex-officio members of the House of Delegates. I will read the names of the Medical Societies that are represented at this time.

SOCIETY	DELEGATE
Blue Earth County	A. G. Liedloff, Mankato.
Blue Earth Valley	W. G. Strobel, Welcome.
Brown-Redwood	J. C. Rothenberg, Springfield.
Camp Release Dist.	E. M. Clay, Renville.
Carlton County	R. G. Spurbeck, Cloquet.
Cent. Minn.	H. C. Cooney, Princeton.
Hennepin County	F. L. Adair, Minneapolis. C. W. Pettit, Minneapolis. J. W. Bell, Minneapolis. J. G. Cross, Minneapolis. R. E. Farr, Minneapolis. L. A. Nippert, Minneapolis. J. E. Hynes, Minneapolis.
Houston-Fillmore	O. F. Fischer, Houston.
Lyon-Lincoln	E. G. Sanderson, Minneota.
Meeker County	J. J. Donovan, Litchfield.
Mower County	R. S. Mitchel, Grand Meadow.
Olmstead County	H. Z. Griffin, Rochester.
Ramsey County	E. W. Buckley, St. Paul. J. T. Christison, St. Paul. F. J. Savage, St. Paul. Thos. Dickson, Jr., St. Paul. F. E. Burch, St. Paul.
Red River Valley	O. F. Mellby, Thief River Falls.
Rice County	M. L. Mayland, Faribault.
St. Louis County	A. J. Braden, Duluth.
Stearns-Benton	W. L. Beebe, St. Cloud.
Upper Miss. Co.	P. M. Holl, St. Sanatorium. G. I. Badeaux, Brainerd.
Wabasha County	E. H. Bayley, Lake City.
Washington Co.	G. A. Newman, Stillwater.
West Central	C. R. Christenson, Morris.
Winona County	B. P. Rosenberry, Winona.
Wright County	J. J. Catlin, Buffalo.

This makes 31 delegates present. I move that the report be accepted and the committee continued until they can complete their list.

Seconded by Dr. R. E. Farr and carried.

THE PRESIDENT: The secretary thinks we should have a roll call and I believe he is right.

THE SECRETARY: It is hardly necessary now, Mr. President, since the credentials committee has practically called the roll.

MR. PRESIDENT: Then we will next have the reports of the committees. First, is the report of the committee on Public Policy and Legislation, Dr. Litzenberg.

DR. J. C. LITZENBERG: Yor committee begs to submit the folowing report:

Minneapolis, Minn.,
Sept. 30, 1920.

To the House of Delegates,
Minnesota State Medical Society.

Gentlemen: Your Committee on Public Policy and Legislation begs leave to submit the following recommendation:

The State Legislature will meet this winter and there will probably be bills considered which will affect the public health and therefore will be of peculiar interest to the physicians of the state.

In the past it has been considered the duty of the committee on Public Policy and Legislation to lobby in favor of or against all bills affecting the public health and the medical profession.

Your Committee believes that such lobbying is too often interpreted as being selfishly in the interest of the profession, and we further believe that there is a changing attitude within the medical profession as to what its attitude should be toward all public health legislation, that is; that such legislation is the concern of the whole people and not of any single profession or class, and that the responsibility of such legislation for public health belongs to the whole people through their representative in the legislature. We therefore feel, as medical men, that we should not lobby or use political methods for the furtherance of any public health legislation, and we believe that the responsibility should be put squarely on the shoulders of the legislature, and that the medical profession through the State Medical Society should act only as advisors to the legislature.

It has for years been customery for physicians to lobby and use their utmost efforts to further public health legislation not in their own interests but unselfishly for the public. In spite of this attitude ulterior motives were attributed to us; however, we care very little about the misinterpretation of oumotives, but a really serious attitude has arisen on account of the belief on the part of those having no faith in us that such bills were in the interest of the medical profession alone and by those having faith in us that insofar as the public health was affected the medical profession would protect the interest of the people without any help from the public. The public itself has taken practically no interest or responsibility in the matter of its own health while the medical profession has received only criticism in its efforts to protect the public, therefore, we believe that the responsibility should be placed where it belongs —upon the shoulders of the public whose own health is at stake, that is, upon the representatives of the people in the legislature.

We believe that we should take no part in lobbying, or solicitation of individual legislators but that the medical profession through its state society should place itself at the service of the legislators when desired, and if such advice is desired, the responsibility then rests upon the legislature and not upon us.

We believe that we should say to the legislature that all responsibility is theirs; that the medical profession is willing to do its full duty in pointing out the dangers or advantages to the public health in any legislation before it. The responsibility for the protection of the people from disease and bettering health conditions belongs to the people through their legislators. The true function of the medical profession is to advise the people and show them how to protect themselves; the doctors mission is to be a teacher and not a political manipulator or lobbyist. The principles here expressed are fundamental and the sooner they are recognized the better it will be for the health of the people.

Your committee believes that the medical profession will be listened to with greater confidence if we take the dignified position of offering to place ourselves at the service of the legislature to give them all the information possible on any subject affecting the profession or the public health; always refusing to lobby or to use political manipulation. We believe that the legislature will not be slow to recognize the value to them of such a dignified and unselfish attitude.

Your Committee therefore recommends that the Minnesota State Medical Society announce to the public and to the legislature that they will take no part in lobbying or political manipulation in public health matters in the future but that the society stands willing to give to the legislators all of the scientific information possessed by the medical profession in public health matters. We therefore recommend that a representative committee be appointed to act in this capacity for the Minnesota State Medical Society and it shall be the duty of the committee to announce to the Public Health Committee of both houses of the Legislature the attitude of the State Medical Society toward such legislation and to tell them that the committee stands ready to give them any information within its power which they may desire upon any public health legislation but that under no circumstances will they assume the position of lobbyists but will act simply and solely as advisors to the legislators when they desire such advise.

Respectfully submitted,
Com. on Public Policy and Legislation.
J. C. Litzenberg, Chairman.
W. H. Magie,
Robt. Earl.

THE PRESIDENT: You have heard the report of the Committee on Public Policy and Legislation, what is your pleasure in regard to this report?

DR. J. C. LITZENBERG: It may be something of an innovation to offer a recommendation to the House of Delegates to legislate a committee out of existence, but we believe that a more representative committee can be appointed and, therefore, offer the recommendation.

THE SECRETARY: I move that this report be adopted. Seconded by Dr. H. M. Workman and carried.

THE PRESIDENT: The next order of business is the report of the Committee on Social Insurance, Dr. Andrews.

DR. J. W. ANDREWS: I am glad to say to the House of Delegates that a speaker has been secured who will appear before the Society on Friday afternoon, Mr. Frederick Hoffman, a man well qualified to give information on social insurance, and I hope that every member of this House of Delegates will have an opportunity to hear him. I wish to say, Mr. President, that I have corresponded with both of the members of the committee other than myself and one has approved of the report as it will be given to you today. The other I have not heard from at all and assume, because of his silence, that he approves of it.

Dr. Andrews then presented the following report:

SOCIAL INSURANCE

This is a question which before the World War was agitating almost every civilized nation of the globe because of the labor unrest, the industrial strikes and the antagonism which existed between labor and capital. While during the war the question lay incubating, it is now again presenting its hydra-head for farther recognition. I say hydra-head because it presents itself in so many different forms

in different countries. Social insurance is a modern institution. It has existed in a modified form for two or three decades but in its present form it is the child of the 20th century. Social conditions everywhere have forced social insurance to the front.

In colonial times it was not a serious thing, from an economical standpoint, for some member of the family to be sick. Every family had its home remedies, such as smart weed, etc., which was administered usually by the mother or grandmother. There was no trained nurses or expert skilled physicians. Other members of the family carried on the work of the farm or the work shop and the financial loss was nil. Now in case of sickness the family must go to the expense of employing a physician, skilled and well qualified in his profession for which he charges a good round fee. Instead of putting up his own medicine he writes a prescription. The friends or the relative must go to the drug store and pay a druggist a good round profit for the medicine. They must pay for having it put up in nice form. Then in many cases a trained nurse must be employed at a cost of from $30 to $35 a week and board. Then there are often dainty extras which our colonial forefathers knew not of. By this modern system of living it cost money to be sick. It is these modern conditions that have forced social insurance to the front.

Germany was really the pioneer in social insurance. Compulsory state industrial insurance had its birth in Germany in 1883. It seems to have originated in the fertile and resourceful brain of Chancellor VonBismark. I do not know just the plan upon which this first compulsory industrial insurance was organized but approximately the plan was as follows:

All persons with an income of $800 or less annually were entitled to the benefit of the insurance. The funds were raised from the state one-third, from the employers one-third, and from the employees one-third, and the fund was handled by a commissioner appointed for the purpose. The amount to be paid by the employees was with-held every month from their salary, it being a certain percentage.

The above figures are not necessarily correct, but so intricate and variable were the plans at different times that we cannot be definite on this point.

There now exists some form of social insurance patterned more or less after the German system, in Austria, Hungary, Sweden, Norway, Italy and other European countries, though in some of these the late war has rendered them inoperative.

The principle of health insurance is approved as a means of distributing the cost of sickness amongst a large number of people. In some states where the health insurance bills have been before the legislatures, amendments to meet the views of the medical profession have been agreed to. Nothing brings greater distress to the life of the workers family than sickness. Without sick insurance of some kind the worker and his family bear this burden alone. The burden of sickness is heavy and falls with crushing force upon some people.

All the leading European countries are trying to meet this problem by the enactment of some form of social insurance.

In our country this is partially met by fraternal organizations carrying accident and health insurance, but in very few instances is it compulsory and where it is left to the choice of the individual he will frequently trust to luck and when taken sick finds that he is without protection.

The medical profession is almost a unit in opposition to social insurance but it is an economic and not a medical question and the provisions of the laws now in force effecting the medical profession is the most essential factor since it is this profession that must administer to the sick, yet the laws governing social insurance have been enacted largely without consulting those whose services were absolutely essential to the undertaking.

If you will allow me to digress a little, let me refer to the fact that our profession generally is ignored in all public legislation. There was an effort made in this state less than four years ago to abolish our State Board of Health as it then existed and reorganize another. The attorneys were consulted, the politicians were consulted, some of the state officers were consulted but the medical profession was practically ignored. In short the whole plan was finally manipulated by attorneys who knew practically nothing about public health, and had it not been for two of our profession at that time in the Senate using their influence against the abolition of the Board of Health this splendid organization which has done so much for the public health of the state would have been abolished; and so it was when social insurance was instituted in England.

In 1910 the English Premier, Lloyd George introduced into Parliament a bill to provide for compulsory social insurance in England. It was patterned somewhat after the German system. He consulted the labor unions, the philanthropic societies, the employes of labor and other classes but absolutely ignored the medical profession; and social insurance has no leg to stand on if the medical profession is eliminated, for the paramount purpose of social insurance is to provide against loss in cases of sickness. The bill of Lloyd George had passed to its second reading in Parliament before the medical profession woke up to the situation. They then fought only those provisions in the bill which had to do with the compensation of physicians and these they fought bitterly. The proponents of the measure argued that the physicians were not unfavorable to the bill from an economic standpoint as they did not attack it on that ground, but purely from selfish motives were they opposing it. The bill therefore went through without change and the physicians had to lie down and take their medicine.

In the United States social insurance, in the compulsory form, was first taken up by a labor committee, self constituted and without legal authority, having headquarters in New York City and a membership of about 3,000 scattered all over the union. This was known as the American Association for Labor Legislation. Their task was first to carry thruout the United States their propaganda of compulsory social insurance and mold legislation to meet their views. They prepared a bill and caused it to be introduced into fifteen different states of the union, not at one time and not in one year but as legislatures of these several states met. The provisions of the bill were as follows:

First: All employees earning less than a given sum (I think about $1,200 annually) were the beneficiaries.

Second: The beneficiaries would be entitled to medical, surgical and dental services, hospital, nurses, and in their homes in cases of maternity the services of physicians and nurses. All of these free to the beneficiaries and in addition to this cash benefits, and funeral expenses in case of death.

Third: A fund to defray expenses of these services by the provisions of the act would be raised as follows: State to pay one-fifth, the employers, two-fifths, and the employees two-fifths. The state of course would meet its obligation. The employers could be compelled to do so by law if necessary. The

employees had a certain percentage of their monthly salary deducted and placed in this fund.

It will be observed that this bill is tinted with autocracy and is not consistent with our free institutions. The bill further provides that the control of funds and their disbursement shall be under the administration of a local commission composed of an equal number of employers and employees subject to the approval of a state board. The bill further provides that these boards shall determine the medical treatment and fix the fees of the physicians. Please observe that the medical profession was not to be represented on these boards. Let us ask you seriously, what would this mean to the profession? This model bill as it was called, was introduced into several legislatures, either as it was prepared by the American Association for Labor Legislation or in some modified form; but the essential provisions of the bill were the same. The proponents of the bill, presented the following arguments in its favor:

(1) About three million people in the United States are sick at any one time.

(2) There are thirty million wage earners in the United States and they lose an average of nine days each year either by sickness or accident.

(3) That the annual wage loss is approximately five hundred million dollars.

(4) That compulsory health insurance will distribute the burden over a large number of people, including the state. The state and the employers to pay 60 per cent of the loss; when those directly benefited pay 40 per cent. In some of these bills the provisions were such that all those laboring men receiving a small income, for example, an annual income of $600 or less, would receive all the above benefits without any assessments against them. The employers in such cases must pay 80 per cent of the benefits.

There are several forms of social insurance in existence in this country, some of which are to be commended; for example, vocational insurance. By this we mean, an insurance association in which only those of the same or of like occupations belong, or can belong. Those following like occupations associate themselves in a social insurance company and agree, or by virtue of membership it is agreed, that a certain percentage from their monthly wages or salary shall be held back to put into the indemnity fund. It is hardly in the nature of an assessment, for membership is not compulsory. A good example of this form of social insurance is found in the Omaha Railway Employees Benefit Association. This was organized a few years ago by the employees of the C. St. P. M. & O. Ry. Co., and the membership in the association is not compulsory, although a large majority of the members of the Omaho road are members of the association.

The beneficiaries of course are all who belong to the association. The fund is created by retaining from the wages of each and every member a certain percentage of his monthly earnings. Whenever a member is sick, from whatever cause, or if he is injured he is entitled to medical and surgical aid, hospital care and medicines, all of these to be furnished free to the patient and the bill paid out of the general fund. It will be observed that in this form of social insurance all of the benefit fund is raised from the beneficiaries. The state pays no part and neither does the employer. The plan is a unique and a good one. It does not apply to the families of the beneficiaries but in a very large majority of cases the beneficiary is the bread earner and to him it does apply.

Another form of social insurance is what is known as Employers Liability Insurance. This has become so common in this country and has been enacted into law in so many of our states that most physicians are familiar with its plan and work. This is accident insurance only and does not apply to sickness and the indemnity is carried wholly by the employer. He can himself be held responsible, or he can carry insurance with some corporate old line company, he paying the premium and the company carrying the risk. Some corporations like the railroad companies prefer to carry their own risk and are entirely responsible. The assumption is that the injury of an employee is a liability and belongs as much to the employer to pay, as does the breaking of machinery or even the wear and tear of the same. Of course in this as in practically everything else, the consumer pays the bill; for the manufacturer or the contractor adds all his expense to his product to contract price, as the case may be, and the consumer pays the bill. Yet it is a very just form of insurance and should be encouraged and nothing in these modern changes resulting from labor agitation has been a greater benefit to the medical profession than the liability insurance. Probably our own experience has been about that of the average physician and our own experience has been as follows: Before the inauguration of the liability insurance we did not collect more than 15 to 20 per cent for services rendered laboring men when they met with accidents. As broken arm or broken leg or some other injury of equal seriousness would lay the man up for weeks and possibly months, stop his earnings and he would be absolutely unable to pay much of a doctor bill. Now while the fees sometimes are a little small, the pay is sure and it is only necessary to send in the monthly bills to the proper companies. In this form of insurance neither the laboring men nor the state pays any part of the indemnity, although a strong effort is being made in this state to make the state a party to the transaction and obligate it financially for at least a portion of the indemnity. We are not prepared to say that this is unwise, although if this is done the laboring man to a degree is subsided. As the law now exists every industry pays its own insurance which is regarded as a liability. You will observe that this latter form of social insurance differs from what we choose to call vocational social insurance, in that the latter provides for sickness and accident both, and the former for accident only.

Brief indeed is the report of your committee on social insurance compared to what might be said on the subject, for it is not only nation wide but world wide. Go to Australia and one finds some form of social insurance and the subject much discussed in political and labor circles; go to New Zealand, to Austria, to Belgium, to England and then over to the United States and the same is true, except in some countries the war temporarily crowded this important subject from the public mind, only to reenter when the time is auspicious.

Your committee does not understand that it is to enter into any argument or discussion in this report as to the merits or demerits of social insurance but merely to present the facts to this body. Perhaps it is proper to say in conclusion that at the last annual meeting of the American Medical Association in New Orleans, a resultion was passed, unanimously we believe, by the House of Delegates condemning social insurance and that like resolutions have been passed by some state societies. We have no recommendations to make but simply,

Respectfully submit this report,

J. W. ANDREWS.

THE PRESIDENT: You have heard the report of

the Committee on Social Insurance, what will you do with it?

DR. J. W. BELL: I move that it be accepted and adopted. Seconded and carried.

THE PRESIDENT: The next report is that of the Editing and Publishing Committee, Dr. Farr.

DR. R. E. FARR: Mr. Chairman and members of the House Delegates: I beg leave to submit the following report from the Editing and Publishing Committee. The committee has held monthly meetings and carried on the work as carefully as possible. Very little change has been made in the policy during the year. Perhaps one notable change has been introduced and that is the enlargement of the journal somewhat to meet the great demand for papers which were highly desirable for publication. We felt that notwithstanding the fact that during the last year prices have been sky high in matters relating to publishing the journal, still the valuable material that was good, that was excellent we might say (and I think the published articles will show that universally) should not be turned down. I may be too enthusiastic, but it seems to me that we could go much farther than we have gone and double what we have done and still not make use of the good material that is being put out and can be put out in this state, until our journal will become of national importance. I may be too enthusiastic in this regard and have no recommendations to make. We published somewhere near two hundred and sixty or seventy pages this year over last, so the valuable material has been pretty well taken care of. The late publishing of some articles was entirely due to the failure of the stenographer to send them in and not to lack of space in the journal.

The financial report has been made from the last meeting up to this time, as it was requested that we make our report date from one state meeting to the other rather than from the first of the year, which has caused a considerable conflict in the reports. Our year ending the 1st of January and the meeting coming at this time made it difficult for the report to be understood, at least in some quarters. The receipts and disbursements were as follows:

Receipts and disbursements on account of MINNESOTA MEDICINE, Sept., 1919 to Sept., 1920 inc.

Remittances made to Treasurer on account of MINNESOTA MEDICINE, Sept., 1919 to Sept., 1929 inclusive	$5,697.73	
Credits received Jan., 1920 at $1.00 per member for subscriptions to magazine for year 1919 and to Sept., 1920	2,702.00	
		$8,399.73
Disbursements account MINNESOTA MEDICINE, Sept., 1919 to Sept. 1920 issue inclusive	$9,174.69	
		$9,174.69
Deficit		$ 774.96

Cost of Printing, including envelopes, second class postage, etc.	$4,379.53
Paper Stock	1,428.48
Bruce Publishing Co., for services including cost of telephones, telegrams, office postage, stenographic services, etc.	1,971.63
Editorial Expense including editors salary, stenographer, etc.	1,035.00
Half-tone illustrations	209.05
Clipping Bureau	66.00
Incidentals	25.00
Addressograph plates, drawers, etc.	60.00
	$9,174.69

I thought a supplementary report of the three years might be of interest by way of comparison, and it is as follows:

Receipts and Disbursements on account of MINNESOTA MEDICINE, 1918, 1919 and Jan., 1920 to Sept., 1920 inclusive.

Receipts account MINNESOTA MEDICINE 1918	$5,369.13	
Recepits account MINNESOTA MEDICINE 1919	5,668.82	
Recepits account MINNESOTA MEDICINE Jan., 1920 to Sept., 1920 issue inclusive	6,856.47	
Accounts Receivable Sept. 20, 1920	1,506.05	
		$19,400.47
Disbursements account MINNESOTA MEDICINE 1918	$5,143.52	
Disbursements account MINNESOTA MEDICINE 1919	6,681.54	
Disbursements account MINNESOTA MEDICINE Jan., 1920 to Sept., 1920 issue inclusive	7,307.48	
		$19,132.54
Surplus		$ 267.93

THE PRESIDENT: You have heard the report of the Committee on Editing and Publishing, what is your pleasure regarding it?

DR. F. R. WEISER: I move that the report be adopted. Seconded by Dr. H. M. Workman; carried.

THE PRESIDENT: We will now listen to the report of the Committee to Formulate a Plan for Reference Committee System, Dr. Head.

DR. G. D. HEAD: At the last meeting of the association it was very apparent to the officers that some means should be provided by which matters coming before the House of Delegates for consideration should have sufficient time allowed in which a proper consideration of the matters might be undertaken and an intelligent report rendered the House of Delegates. For example, I remember there were presented to the President four or five different matters with relation to public health and they were brought in before the House of Delegates, but no action was taken upon them at all. No intelligent consideration of them and no motion was made, although they were all matters of importance. Now if there had been a special Reference Committee appointed by the president that could have acted upon those matters and presented a report the last day of the session, we could have had some intelligent action by the House. That was the reason why in conference with the president and secretary it was thought best to have some committee for this purpose and Dr. Adair, our present President, saw fit to appoint a committee, consisting of Dr. W. A. Coventry, Dr. H. Longstreet Taylor, and myself, to draw up a plan, and this is our report.

The special committee appointed by the president to formulate a plan for the reference committee system reports as follows:

This committee recommends that a reference committee system similar to that in use by the American Medical Association be adopted by the State Society in order to facilitate its business and give time for the proper consideration of such important matters as may come before the association. The committee would recommend that these committees be ap-

pointed by the incoming president, that each committee consist of three members, and that the chairmen of the committees be appointed for a three year period, and the other members for a two year period, one member retiring each year; that matters requiring consideration by the society be referred by the president to the respective committees upon the first day of the session, and that these committees report at the first session of the society upon all matters referred to them holding over from the preceding year, and, on the second day of the session, upon all matters referred by the president the first day of the session.

I recommend that this committee be held over until the coming session and that they present a report at that time. If the matter can be decided and a report brought in on the last day of the session, this committee will report upon the last day and the House of Delegates can take the matter up then and discuss it. All of you who have acted in the House of Delegates of the A. M. A., I am sure, have been impressed with the splendid manner in which the business of that Association is conducted, the intelligent way in which matters of importance are considered carefully and disposed of through this reference committee system. Our committee has recommended as follows:

The committees recommended are as follows:

1. Reference Committee on Sections and Section Work.
2. Reference Committee on Rules, Order of Business, Amendments to the Constitution and Bylaws.
3. Reference Committee on Public Policy and Legislation, (the standing committee now in existence to act as a reference committee for the house of delegates upon matters of public policy and legislation.)
4. Reference Committee on Medical Education.
5. Reference Committee on Public Health, Hygiene and Sanitary Science, (the standing committee on Public Health to act as a reference committee for the House of Delegates upon these matters.)
6. Reference Committee on Miscellaneous Business.
7. Reference Committee on Publications: Editing and Publishing of committee to act as the reference committee upon all matters related to the publication of the Journal and other publications.

GEO. DOUGLAS HEAD, Chairman.
W. A. COVENTRY.
LONGSTREET TAYLOR.

THE PRESIDENT: What will you do with the report of Dr. Head as Chairman of the Committee?

DR. R. E. FARR: I move that the report be accepted and adopted. Seconded by Dr. J. W. Bell and carried.

THE PRESIDENT: Now we will have the report of the Hospital Committee.

THE SECRETARY: At the request of Dr. A. W. Abbott, the Chairman of this Committee, I will read his report:

Sept. 29, 1920

House of Delegates,
Minnesota State Medical Ass'n.

Your Committee on Hospitals met several times during the year going over the status of hospitals in the state. Our work was principally confined to discussing and reporting to the A. M. A. the conditions of hospitals desiring interns. Fortunately we were able to report favorably upon most of them. Through some error the St. Mary's Hospital of Minneapolis was not placed upon the A1 list. The Committee reported at its last meeting that St. Mary's Hospital should be placed in that class. However, the matter is now corrected and in the next issue of the A. M. A report this hospital will be properly registered.

Respectfully submitted,
JNO. T. ROGERS.
ROBT. EARL.
A. W. ABBOTT, Chairman.

THE PRESIDENT: What will you do with the report, gentlemen?

DR. J. C. CROSS: I move its adoption. Seconded by Dr. W. L. Beebe, carried.

THE PRESIDENT: Is the Committee on the collection of the papers of the late Dr. H. A. Tomlinson ready to report? If not I will pass that.

THE SECRETARY: I have before me a letter from Dr. Strathern.

THE PRESIDENT: Please read it.

The secretary then read the following letter:

Sept. 22, 1920

Dr. Earl R. Hare,
Minneapolis, Minn.
Dear Doctor Earl.

In regard to the publication of papers of the late Dr. H. A. Tomlinson I wish to say that I have nothing to report in addition to what I have already written to you. I will try to be down and report in person. Possibly I may be detained, if I am I wish that you would get a report from Drs. Holman or Schmidt of Mankato, Minn., who know about this and who have the papers. I told you that they declined to turn them over to me as they were without authority to do so, and this tied my hands so that I would not get the matter before the publishers to get figures. Am sorry that I could not give more information. I will write Dr. Holman today and see what he says.

Yours truly,
F. P. STRATHERN.

THE PRESIDENT: I think we will continue this Committee if there is no objection.

THE SECRETARY: It has already been continued for about six years.

THE PRESIDENT: I think it is in good shape to continue further. (Laughter.) We will next listen to the report of the Committee on Necrology, Dr. Stewart.

DR. A. B. STEWART presented the following report:

"Mr. President, Members of the House of Delegates:

Most happy would your committee on necrolgy be if it could report that since our last meeting no one of our members had started on that journey to infinite space from whence none has ever returned. But God has willed otherwise—our membership has not escaped—and we are called upon to record the names of

E. E. Wells, Stillwater.
B. J. Merrill, Stillwater.
George R. Curran, Mankato.
Geo. L. Gates, Winona.
Howard Lankester, St. Paul.
L. M. Davis, Wadena.
J. W. Little, Minneapolis.
C. J. Rignell, Minneapolis.
J. H. Stuart, Minneapolis.

who have ended their pilgrimage of earthly life, with its doubts and uncertainties and limitations, and have entered that longer life where all things are known.

No more will they feel the surge of joy at the first cry of the new born babe nor soothe the trembling steps of age on the journey to the tomb.

No more will they guide the hopes of youth or counsel the man at mid-day of life. They were not the failures of humanity but were personalities that won distinction in a great profession.

The coming of what we call death is as inevitable as the tide that creeps gently upon the shelving sand or hurls itself with flying spray upon a rock bound coast.

Death is but an accoucher, sent by Almighty God, to assist our birth into that better life where we may achieve perfection in the presence of the Greatest of all Physicians.

They have left us a noble example, and if we mourn now, let it be not for them but in sorrow for those of us who can no more harken to their counsel or listen to their teaching.

"I was not aware of the moment when I first crossed the threshold of life.

What was the power that made me open out into this vast mystery like a bud in the forest at midnight!

When in the morning I looked upon the light I felt in a moment that I was no stranger in this world, that the inscrutable without name or form had taken me in its arms in the form of my own mother.

Even so, in death the same unknown will appear as ever known to me. And because I love this life, I know I shall love death as well....."

Let us stand for a moment while we turn our thoughts from our labors and pay a silent tribute to their many virtues and the esteem in which they were held by those who knew them. (The House of Delegates arose and stood with bowed heads for a moment as a mark of respect.

THE PRESIDENT: What is your pleasure, gentlemen, in regard to this report?

DR. R. E. FARR: I move that the report be accepted. Seconded by Dr. J. W. Bell and carried.

THE PRESIDENT: Now we will have the report of the Member of the National Legislative Council, Dr. Ritchie.

The Congress of Medical Education and Licensure was held March 1, 2, 3, 1920 at the Congress Hotel, Chicago.

The Congress is composed of three Associations:

1. The Council of Medical Education of the A. M. A.
2. The Association of Medical Colleges.
3. The Federation of State Medical Boards.

The appointment as Delegate from the State Medical Association is a distinct privilege. While the occasional delegate can have but little influence in such a group, personally I will say that I have never attended a more interesting, instructive meeting. The substance of the discussions are in no part clinical, but deal with general policies, and forms of teaching medicine, not only from the Academic standpoint, but dealing with methods and standards of practice.

In many ways the men attending combine from several angles more power and influence upon the present and future method of teaching and practice of medicine than any other group of men that meet in this country. Teachers of Clinical Medicine and Surgery, Pathology, Physiology, Pharmacology, and other branches of Medicine, but associated with them and profoundly interested and interesting too, appear on the program, students of Educational Methods as Abraham Flexner, Presidents of Universities, the chiefs of the Army and Navy, and their representatives, the deans, and their associates, of all the Medical Colleges, and men along lines of Medical Research headed by Dr. George Vincent of the Rockefeller Institute.

The discussions are broad and general, and the evidence presented is most honestly and frankly discussed. There was not one paper on the program which did not show a vast amount of investigation, deep thought, earnest consideration, in the very manifest effort to elevate the standard of teaching, not only of the undergraduate, but to arrange for opportunities of graduate instruction, especially the man already in practice who desires to augment his general knowledge or extend his special studies.

I saw many times the old question of the relative importance of the clinical and laboratory development, and the debate as to their general appreciation and importance in the schools.

Through the courtesy of Dean Lyon I was one of two or three foreigners invited to the annual dinner of the Deans of the Medical Colleges, where I heard most intimate discussions, all striving for improvement, all looking toward the future, all estimating the experiences of the past, and with, what seemed to me, an earnest endeavor to reach the truth of every question and an honest purpose to elevate the plane of the Practice of Medicine.

We, in clinical work, having but little to do with these policies and plans, can hardly appreciate the, at times, seemingly unsurmountable difficulties arising constantly in the management of our medical schools. It is not uncommon to criticize this event or that occurence during the routine of a school year, but a visit to such a meeting as this will make one very charitable, very considerate in all matters as one can hardly be other than impressed with the stupendous questions involved.

We can be sure that these questions are in competent hands, who seek progresss by evolutionary as opposed to revolutionary methods, and by such clearing houses of thought and experience as this Congress, that standardized efficient plans will eventually be made which will raise the general plane of our practice above all others.

I have appended the Program of the meeting.

H. P. RITCHIE.

THE PRESIDENT: You have listened to the report of Dr. Ritchie, what will you do with it?

THE SECRETARY: Mr. President, I move that the report of the Member of the National Legislative Council be accepted. Seconded and carried.

THE PRESIDENT: We will next listen to a report of the Committee on Narcotics, Dr. J. W. Bell.

DR. J. W. BELL: I have here the report on the narcotic drug situation, as follows:

Narcotic Drug Situation

Narcotic drug addiction is a national problem and menace. It is estimated that we have 2,000,000 drug addicts in the U. S. and no direct evidence of the number diminishing.

Your Committee, after a careful investigation of the narcotic drug situation in Minnesota, is compelled to confirm the opinion of the special committee of the American Medical Association that the Harrison Narcotic Law has failed to restrict narcotic drugs to their legitimate use. This we believe is largely due to the failure of the government to properly restrict the importation of opium, coca leaves, and preparations thereof, including the vicious, artificial alkaloid, heroin. In a recent government report it is claimed that 90 per cent of the amount of narcotic drugs entered for consumption in the U. S. is used for other than legitimate medical purposes. It is impossible to enforce the Harrison law in the face of this over-supply of narcotics.

At the present time there is no accounting of the opium or its alkloids imported into this country, and no control over the amount manufactured, or the destination of the products after they have passed through the manufacturer's hands.

The responsibility for the control of the illicit drug trade, and narcotic drug addiction, is shared by the government, the medical profession, and the pharmaceutical interests. The medical profession cannot

escape its responsibility, but should meet it squarely, by purging its ranks of the few depraved, degenerate members, who, joining with the criminal class, are largely responsible for the continuance of the illicit drug traffic. Your committee feels that the State Board of Medical Examiners can be of great assistance in the eliminating process, by revoking the license of any offending physician.

Your committee has attempted to secure the views of the pharmaceutical interests, especially those of the retail druggists, and the government field men, also the members of the legislature. Burdensome as the Harrison Law is to physicians it is even more so to retail druggists. Your committee feels that the Medical profession should seek to co-operate with the Pharmaceutical Interests, especially the retail druggists in framing supplementary legislation.

Recommendations

(1) That some one bureau or department, preferably the U. S. Public Health Service be given complete control of the importation and distribution of habit forming drugs.

(2) That employees of the department or bureau in control of the enforcement of the Harrison Law, be men familiar with its technical requirements, physicians or registered pharmacists.

(3) That heroin be eliminated from all medical preparations; that it be not prescribed, dispensed, or administered, and that the importation, manufacture and sale be prohibited in the United States.

(4)) That the ambulatory treatment of drug addiction is a delusion, and that it be abandoned and condemned.

(5) That some form of institutional or custodial care is absolutely necessary to success in the treatment and care of confirmed addicts.

(6) That the State Board of Medical Examiners be requested to revoke the license of any physician known to be engaged in illicit drug traffic.

(7) That the medical profession seek to co-operate with the pharmaceutical interests of the state in securing additional or in modifying existing legislation.

(8) That the bill introduced by Senator France in the Senate and Representative Rainey in the House, to provide aid from the National Government for the several states in the prevention and control of drug addiction, and the care and treatment of drug addicts, be approved, and that Senator France and Representative Rainey be so notified.

JOHN W. BELL, Chairman.
E. T. F. RICHARDS.

THE PRESIDENT: You have heard the report of the Committee on Narcotics, what is your pleasure?

DR. R. J. HILL: I move that the report be accepted and adopted. Seconded by Dr. R. E. Farr and carried.

THE PRESIDENT: We are now ready to hear the report of the Committee on Cancer, Dr. Robertson.

DR. H. E .ROBERTSON: The report is as follows:

REPORT OF COMMITTEE ON CANCER

Your committee desires to make the following recommendations:

1. That the Minnesota State Medical Association strongly indorses the efforts of the American Society for the Control of Cancer to promote knowledge of this disease and its relief both among laymen and members of the medical profession.

2. That the association continue a committee on cancer and approve the appointment by this committee of a group of lecturers on the control and prevention of cancer, who shall, from time to time, speak before public gatherings on this subject.

3. That the efforts of the association in this line be advertised to various civic and welfare organizations in the State, informing them of the purpose of these lectures and inviting them to co-operate in providing opportunities for bringing such lectures before the public.

4. That a pamphlet be prepared which shall be used to spread the gospel of the early diagnosis and treatment of cancer throughout the State.

5. That for the purposes of paying the necessary expenses of such efforts a certain sum to be determined by the association be placed at the disposal of this committee, all bills paid out of such fund to be approved by the President and Secretary of the Association.

Respectfully submitted,
H. E. ROBERTSON, Chairman.
E. C. ROBITSHEK.
W. C. MCCARTHY.

THE PRESIDENT: What shall we do with this report of the Committee on Cancer?

DR. J. W. BELL: I move that it be accepted. Seconded by Dr. R. J. Hill. Carried.

THE PRESIDENT: We will now listen to the report of the Committee on Public Health, Dr. Smith.

DR. C. E. SMITH: This committee has had nothing referred to it this year and has not been called together but we have had conferences by letter and have formulated a report.

REPORT OF THE PUBLIC HEALTH COMMMITTEE MINNESOTA STATE MEDICAL ASSOCIATION

During the past year no matters have been referred by the Association to this Committee for Consideration. Neither has it been deemed necessary to call the Committee together. However, correspondence between the members of the Committee shows that it is the opinion of this Committee that some ways should be devised whereby the State Medical Association as a whole could be brought into closer contact with the public health movement throughout the state. The Secretary of the Minnesota Public Health Association had in mind some scheme whereby the State Medical Association would be asked for co-operation in public health matters, but if such a plan was ever formally brought to the attention of the officers of the Association it was never referred by them to the Public Health Committee. The Secretary of the State Board of Health believes that the individual physicians making up the State Association are all keenly mindful of the police measures necessary to protect the populace, and that the governmental state health body will receive at all times in the future, as it has at all times in the past, the support of physicians generally.

This scheme of co-operation between this Association and the various health organizations, both extra-governmental and governmental, would cover the point that physicians generally should be asked to assist in carrying wherever possible the doctrine of better public health conditions to the people. Some of the paragraphs which might be touched upon in consideration of this subject of co-operation are, (1) the co-operation of county medical societies with the sanitary units for the selection and adequate reimbursement of local health officers, (2) the co-operation of the members of said societies with this health officer in matters of diagnosis, (3) the co-operation of the health officer with the societies in matters of report of prevalence of communicable diseases in that district, (4) the co-operation of the State Association with the State Board of Health in its plan for the eradication of trachoma on the Iron Range and on the Indian Reservations, in the establishment of a division of nursing in the State Board of Health, in the plan for county health officers, and in its desire to better its long existing underfinanced condition.

It is with intense pleasure that comment is made on the situation that there is no quarrelling among the various organizations interested in public health in Minnesota at the present time. The field of activity of the Minnesota State Board of Health, the Minnesota Advisory Commission of the State Sanatorium for Consumptives, the Minnesota Public Health Association and the Red Cross seems very adequately defined for each body. The needs of the people of the state are such that there is now an apparent field of usefulness for each of these organizations and the tendency towards co-operation is one which should be encouraged by this Association in every way possible.

Whether the policy of doing nothing to acquaint the legislature with the needs of the people generally in public health matters can be continued in view of a request of the people that the doctors should advise the legislature of needs in these subjects is one for consideration by the Association. Certainly public health in Minnesota will not receive the attention from the people to which it is entitled if the doctors do not interest themselves in its behalf; and furthermore, the medical profession which should be the leader in public health matters will soon find that it is occupying a subordinate position in these matters if physicians do not exert themselves. It would be exceedingly regrettable to see public health adminintration and the formation of public health programs taken out of the hands of the physicians and put in the hands of laymen for construction and conduction, leaving to the physicians merely the privilege of giving technical advice when asked.

Respectfully submitted,

C. E. SMITH, Jr.
Chairman.

May I digress for a moment to call attention to the legislative situation, which has been touched upon before? The legislature as it will convene the first of January contains no physician in either house. The closest approach is a dentist in the House of Representatives. There is no one in the legislature who has any definite knowledge of medical or public health needs. That condition existed at the time of the last legislature, but it did not before that, when there were physicians in the legislature. This year it will be as I have outlined, without any physician. The last session had as its chairman a butcher. The most educated member on the committee was a locomotive engineer with socialistic tendencies. An exceedingly able second to this man was a lawyer who was a great friend of the Osteopaths, and the other man was a German farmer from a remote section who had no idea of public health matters. In spite of that we did not get done up so very badly, but it is not a question of how much we can resist but of how much we can advance. If Dr. Litzenberg in his recommendation means by lobbying to advise the Association to do nothing in the way of lobbying, if he means that we should take no interest in public health matters and should not be on the ground, I do not think it is the right course to pursue. I will agree that there should be no undignified procedures, but I do believe that the Association should be sufficiently interested in medical legislation to have its members active in advising with the legislators throughout the session. The question frequently comes up, what do the doctors think about this or that. When told that the doctors are waiting to be asked they say, if the doctors will not play the game as others do, they cannot expect much. The legislators license osteopaths and chiropractors; that is true. As an illustration, notice how the bill for chiropractors went through. If that is to continue we should do nothing, but if that is to be stopped, I think we should be more active than we have ever been in the past. (Applause).

THE PRESIDENT: You have heard the report of the Committee on Public Health, what will you do with it?

DR. H. M. WORKMAN: I move that the report be accepted. Seconded by Dr. J. J. Catlin and carried.

THE SECREARY: Mr. President, I move the reports of the Committees as submitted be adopted. Seconded by Dr. H. M. Workman and carried.

THE PRESIDENT: Now we are ready to consider the recommendations of the Council. There are three and at the present time a motion was made, seconded and carried that the first two be considered together. Will the Secretary please read those recommendations?

THE SECRETARY: It is recommended by the Council that the House of Delegates grant a charter to the newly organized Brown-Redwood County Medical Society. Second, that Jackson County be added to the territory of the Southwestern Minnesota Medical Society.

THE PRESIDENT: If I remember correctly, the motion was made that these two recommendations be considered together. It is now before the House if you chose to adopt it.

DR. R. E. FARR: Would it not be better to consider each of these two subjects separately? I would favor voting this motion down in order that the two may be considered separately.

DR. E. M. CLAY: I withdraw my motion. (Second agreed).

DR. R. E. FARR: I move the granting of the charter to the newly re-organized Brown-Redwood County Medical Society. Seconded by Dr. E. M. Clay and carried.

DR. F. R. WEISER: I move you that the Jackson County Medical Society be added to the Southwestern Medical Society and a charter granted to that effect. Seconded by Dr. J. W. Bell and carried.

THE PRESIDENT: Now then, I will ask the Secretary to read recommendation No. 3.

THE SECRETARY: It is recommended that a per capita tax of $2.00 per member be credited to Minnesota Medicine, beginning October 1, 1920.

THE PRESIDENT: What will you do with this recommendation?

DR. F. R. WEISER: I move its adoption. Seconded by Dr. W. F. Braasch and carried.

THE PRESIDENT: Next we have unfinished business. The report of the Secretary, the report of the Treasurer, and the reports of the Attorneys for the Association were accepted but not adopted. I should be glad to hear a motion to adopt.

DR. R. J. HILL: I move you that the report of the Secretary, the Treasurer, and the Attorneys be adopted. Seconded by Dr. J. C. Litzenberg and carried.

THE SECRETARY: A question of information. Does the adoption of the Secretary's report mean that the House is favorable to the extension of the State dues to $5.00 per annum?

DR. R. J. HILL: It will have to be if we put $2.00 to Minnesota Medicine. We are about out of funds and barely able to run as it is.

THE PRESIDENT: If you wish to take absolutely definite action on this in order to do business, it will have to go through the ordinary course of business. What comes next, Mr. Secretary?

THE SECRETARY: At the last annual session the Secretary was instructed to present at this session two resolutions. Pursuant to those instructions from the House of Delegates the Secretary moves, first, that Chapter XI of the By-Laws relating to medical defense be stricken out; second, that Chapter XII of the By-Laws, entitled "Amendments," be renumbered XI.

THE PRESIDENT: You have heard this resolution, what is your pleasure?

DR. J. T. CHRISTISON: I second the adoption of this resolution.

DR. W. L. BEEBE: For the information of the House I would like to have the Secretary read these sections of the By-Laws.

THE SECRETARY read Chapter XI, entitled "Medical Defense," and Chapter XII, entitled "Amendments," as follows:

CHAPTER XI—MEDICAL DEFENSE

Section 1. Active members of the Minnesota State Medical Association who have paid all dues, assessments, and other charges assessed or levied by the Minnesota State Medical Association, shall be entitled, on conditions hereinafter specified, to receive, without personal expense thereof, legal advise and court service of an attorney or attorneys-at-law in the employ of the Association, witness fees for the purpose of conducting their defense in any court in this state, when they are accused of malpractice, or of illegal transactions in connection with the commitment of persons to institutions for the insane.

Sec. 2. It shall be the duty of the Council, severally or collectively, to investigate all claims of malpractice against members, to adjust such claims in accordance with equity where possible, and, if in their judgment an adjustment is impossible, or the claim is unjust, or the damage sought is excessive, to tender such help, aid, and counsel as they may see fit. They shall be empowered to contract with a member of the bar of Minnesota as legal counsel of this Association.

Sec. 3 The Counsel shall make an annual report to the House of Delegates at the annual meeting for the year previous ending December 31st. This report shall contain an enumeration of all suits or threatened suits for malpractice against members of the Minnesota State Medical Association which have been properly presented to them for action.

Sec. 4. The legal services herein provided for shall be granted only on the following conditions:

First: Any active member desiring to apply for malpractice defense hereby provided, shall immediately upon receipt thereof send to the secretary of the Minnesota State Medical Association, any letter, process of court, or other evidence of threatened ligitation in connection with such malpractice case.

Second: It shall be the duty of the Secretary to forthwith examine the financial records of the Minnesota State Medical Association, and if such member so applying is found to have paid all arrearages, dues, or other charges due the Minnesota State Medical Association for the year, he shall certify those facts to the Council of the Minnesota State Medical Association, and forthwith send to such Council the papers received from such applicant for defense, and such Secretary shall forthwith return to the applicant, if he shall find that the applicant has paid all arrearages due the Minnesota State Medical Association, a formal application for defense containing authority for the said Association through its attorney to defend the action and granting to the Association and its attorney sole power to conduct the defense thereof, and agreeing not to compromise or settle said claim for damages for said alleged malpractice without the consent of the Minnesota State Medical Association or its attorney. The said applicant shall furnish and return to the Secretary with his application duly executed, a full, accurate and complete history of his treatment of the case out of which the alleged malpractice arose, giving dates. names of witnesses, nurses, and other attendants, all of which information shall, upon its receipt by him, be forwarded by the Secretary of the Minnesota State Medical Association to the Council of the Association.

Third: If, on the other hand, the Secretary finds that any member so applying has not paid all arrearages as herein specified, then and in that case, he shall return at once to the applicant all papers or memoranda received by him from said applicant, together with a statement that he is not entitled to defense and the reason therefor.

Fourth: It is further understood between each and every member of the Minnesota State Medical Association that under no condition or contingency will the Minnesota State Medical Association pay any sums awarded in settlements compromise, or by any verdict against any member sued for alleged malpractice, and each member applying for the services of the attorney of the Association in any malpractice case, shall agree not to obligate in any manner the Minnesota State Medical Association or any persons connected therewith to the payment of any sums whatsoever for any. purpose.

Fifth: The Minnesota State Medical Association will assume the defense in a suit for malpractice against a member only while he is such and when the alleged malpractice occurred subsequent to March 31st, 1910, and to the date on which the member joined the Association.

Sixth: The Association may decline to defend an action, where the claim of malpractice is entered as a defense to a suit for a bill, unless the attempt to collect the bill by suit is made within one year after the services were rendered.

Seventh: This chapter shall be in force on and after April 1st, 1910, and the year shall end on the last day of December of each year.

The purport of the resolution is to strike from the By-Laws all that I have read.

THE PRESIDENT: You have listened to the reading by the Secretary of that portion of the By-Laws which is embodied in the motion that is now before the House. Is there any discussion?

DR. A. G. LEIDLOFF: I think we cannot abolish this according to the By-Laws until December 31st of this year, to be effective at that time, for the reason that the By-Laws state that it shall be in force until the thirty-first day of December.

DR. E. M. CLAY: I would like to know if this Chapter XI is abolished will it then be necessary to increase our dues to $5.00 per annum?

DR. R. J. HILL: For six years yet we are liable for anything that may happen. We are not released from liability to defend suits by reason of the statute of limitations, so we have to defend any suits that may arise in the interim even though we abolished it today.

THE SECRETARY: Dr. James of Mankato, at whose request this resolution was introduced, is not here to speak for himself. The Secretary did not wish to speak for him. There has been a decided opposition to the defense feature of our constitution emanating from the district which Dr. James represented in the House of Delegates last year. There is also a decided opposition to the defense feature in the northern portion of the state, the district not being represented here today. Very decided opposition has developed in these two poles of the state. There are other places where men are favorable to the defense feature. I do not wish to take any ground pro or con with reference to the abolishing of this part of our By-Laws. I do believe, however, inasmuch as there has been considerable discussion in the House of Delegates on prior occasions, and inasmuch as there has been much dissatisfaction on the part of the delegates, that this motion should be discussed at this time and finally disposed of. I wish to say

that our defense feature while inadequate so far as the payment of judgment is concerned, has been extremely adequate so far as defense is concerned and we are getting it at a price which is not worth mentioning. Personally, I have but little patience with the idea that we are now paying too much for dues to the State Association. I think we are paying far too little and when we take into consideration the elevation of prices in every line and for every commodity, and when we remember that our dues have remained stationary and that we are still getting the benefits of the things that the Minnesota Association offers to us, I think we should raise our dues to the point where our professional affairs will be properly looked after. In every other line we are willing to spend our money but when we begin to think of spending money for our own personal interests, we begin to quibble about what we are spending. Our payment for our defense feature is entirely inadequate in proportion to the services which have been rendered by the State Association.

In answer to Dr. Clay's question, I would say that if this Chapter XI is abolished, I would still feel that it is necessary to raise our dues to five dollars, and I think we should feel fortunate that it is not necessary to raise them to six or eight dollars in order that our affairs may be properly looked after. I hope there will be a full and free discussion of this question.

DR. A. J. BRADEN: As the Doctor suggested, I do think they are strongly opposed to the insurance feature in my part of the state. We certainly are not paying too much to the society if we get value received for what we are paying. Our members feel that they are not, so far as the insurance feature is concerned. Our society several years ago took out insurance in what is called a group plan from the Aetna Insurance Company. By taking it out that way we have the support of the whole profession and there is a committee within the society so that if a member is sued for mal-practice, this matter comes up before the committee and if under the circumstances they feel that a settlement is better, the settlement is recommended. If they feel that the member is right and that he should be defended, he has the united support of the whole society. We find that a very strong club to use against any of the members who are apt to testify against any member of our society. Several years ago I was threatened with a suit, which, fortunately, was not brought. I presented the matter to the secretary, as required by the By-Laws, and he at once wrote back that they would be very glad to take the matter up if they had entire charge of the business. That is, they would not associate themselves at all with the insurance company would not give me any assistance unless I would throw over this insurance and leave it entirely to the State Society. I think none of us could afford to do that. If we had this group insurance in the Aetna Insurance Company, we could not afford to take it out of their hands and turn it over to the State Society. They might defend it successfully and then again, when the member had done the best he could and the Society was of the opinion that he was entitled to a defense, they might get a judgment against him. Under these circumstances if our Aetna Society was crowded out, the State Society would pay nothing and the other certainly would not if they had no hand in the defense. If a member holds insurance in two different insurance societies, they are always willing to unite. I have known of cases of that kind where a member was insured in the Fort Wayne Company and in an old line company, where the two united and aided in the defense. Now when I was threatened with suit if that had been brought and the Aetna Company was willing to take charge, if the other was willing to help, the State Society attorney could have been of much assistance, for he must have had a lot of decisions and would probably have more information than other attorneys throughout the state. If he was willing to help without assuming liability for any payment, we would feel better toward it, but we have a membership of 135 and a large majority are in the group plan insurance. We are paying our money and getting no value received. There is no member who would feel like throwing over our group insurance where we have the support of the whole society to conduct a case successfully and accept the State Society. That is one of the reasons why the members up there are opposed to this plan of insurance. They feel they are not getting value received and it would not hurt the State Society if they want this insurance to enter in and help, because their attorney must necessarily have much information and might be of great assistance in conducting the defense.

DR. W. H. MAGIE: I am not entitled to speak before this House of Delegates but would like to say a few words.

THE SECRETARY moved that Dr. Magie and any other member of the Association who so desired, be granted the privilege of the floor. Seconded and unanimously carried.

DR. W. H. MAGIE: I have listened to the arguments of Dr. Braden. I also have been threatened by suit for mal-practice and also have some experience with our State Association similar to his, and I have defended a suit besides. I defended, of course, my own suit through the insurance company. This insurance that we have has another feature. The doctor does not care about the dollar a year he spends for this Association any more than I do. I do not think the St. Louis County Society, if they had a full meeting and this matter was discussed, would vote to withdraw because they got nothing back individually for the dollar they are spending. There are many men in the country districts, in the farming districts, and small districts where this is very important, because he has not the Association of 135 to back him up. It behooves this Medical Association to be organized to defend these black-mailing, mal-practice suits that are brought against us and sometimes they are instigated by our neighboring practitioners. When these black-mailing attorneys as well as physicians know that this is the case, they say, "We want to be careful because the whole medical profession of the state is behind these men." We should consider it very carefully. The expense is infinitesimal; I would give $10 a year to keep up the Association if necessary, although I never call upon it. I think the matter should be discussed thoroughly and not thrown over without proper consideration. If a few societies of 15 or 20 get together and consider that they personally are having an affront because the State Association wanted them to put the case entirely in its hands, that is only a small percentage. It is all right if you wish to defend your own suit, but the fact that we are organized is of great importance.

THE SECRETARY: If I may be excused for speaking more than once on this subject, I may have some information that is not disseminated as well as it should be. Old things have passed away and new things have come into existance. The State Association reserves the right for the defense of every member and since this particular line of work has been under my care, we have in three or four instances co-operated with the attorneys of other associations or other companies in the defense of our members. I want to say to you gentlemen today, and I do not wish any mistake to be made in reference to the attitude of the House of Delegates toward its mem-

bers, that the Association is here to defend its members and not to cast them aside without consideration. It is here to defend its members and it has in many instances gone out of its way to defend them for two dollars a year. Now we do co-operate; not in every case because, apparently, the insurance company does not wish us to co-operate, but we do co-operate when it is requested by the insurance company and by the member. This does not happen in every case but in some cases.

Now, in reply to the question of whether certain districts have been neglected, I wish to say that one section which is most bitter toward the defense feature of the Association has in the past year had one of its members defended in a six day suit and as well defended as any one in the United States could have defended him. In one instance last year one of our members was sued and a verdict of $3000 rendered against him. Our attorneys, undaunted, carried it to the Supreme Court and had it reduced to $500. A large majority of the cases have not even gone to the jury, but have had directed verdicts by the court because they have been so successfully defended by our attorneys. I am not talking for or against defense, but I do want the defense feature of our constitution to have a fair deal in this discussion, and in order that it may have a fair deal I want you to know some of the inside facts that are known in the Secretary's office. The organization is certainly worth a great deal, as Dr. Magie said, but I do not think it is worth any more to the country than to the city practitioner.

DR. E. M. CLAY: I simply asked the question about the fees. I wanted it understood and want everybody to understand it. I do not wish to stand up here before the members of the House in the light of a tight-wad. I do not care if it costs ten dollars, I would pay it. I have never asked defense from the State Society or any other. I have been threatened with suit in two cases but have always been able to settle things myself. When the people came to my office and said they would not pay me, I locked the door to my private office and settled the matter myself (laughter). They always paid the fee before they went out and in neither case did they bring suit (laughter and applause)).

DR. R. E. FARR: I am not like Dr. Hare, I am going to take a position againt this kind of insurance. This thing was practically settled last year by the House of Delegates and we put it over because it was necessary to change the constitution. I happened to be in on the committee and helped to organize this thing; some were against it and some for it. I, too, would be very glad to see this go on if we paid ten dollars, or even fifteen dollars, because I think the organization feature is a good thing and very important to this society, but if a member wishes to be protected he must carry the other insurance as well because we do not get the protection we need. In the case of the member who had the judgment reduced to $500, that would carry the insurance of several members in some insurance company. If we can pay enough to get an organization that will protect us so that we will not have to carry the other insurance, I have no objection to it. I do not think we should quibble about the two or three dollars. The question is, do we get a better defense from the State Society than from the other contracts. A few years ago I had an example of this in the case of a friend who had operated on a case before I did. I was insured and he was not. It was a sponge case and he took up the case before the State Society, thinking he was protected. However, the report came back that under the circumstances he was evidently guilty and could not be defended. Then they found that they were suing me with him and I called upon my insurance company and the thing was settled out of court. We got a very reasonable settlement and think we did very well. He would have been out several thousand dollars but he cut off with $350 or something like that. This we should consider. It seems to me the crux of the whole thing is not whether you are going to be defended. Of course, you are going to be defended. We are sometimes guilty, but we get stuck whether we are guilty or not, but it is only occasionally, and the fellow that does get stuck $2500 or $5000, or as was the case in a city not far from St. Paul, $8000 and fees,—by George, it takes me a long time to get $8000 together—and when I can have that defense by paying $15 per year I am going to do it. I do not see the object of this sort of thing unless we change it and get the protection we should have.

DR. W. H. MAGIE: Nobody objects to anybody taking outside insurance, but the fact of the organization is the thing to impress upon our members. That is the feature here and we want everybody to understand it. Dr. Hare says they do defend them and do co-operate with other attorneys or other companies, and that is fine. There is nothing in that that interferes with his taking insurance outside. I have it and I do not think I would care to be without it. I would like, Mr. President, to have expunged from the records the swear words Dr. Farr used (laughter).

DR. R. E. FARR: I would like to ask if Dr. Magie thinks there is anybody in the world who does not think we are organized?

DR. J. G. CROSS: There is good evidence that that chapter was written by a lawyer. I do not see why we cannot cut out some of the phraseology and correct the whole business. I can see how if we left out the word solely, or the attorneys are to be given sole charge of the defense, the attorneys for the State Medical Society would object and we are likely to have some trouble in getting attorneys to take this job, but we could get some and why should we not be permitted to have co-insurance in this sort of thing as well as any other? I make the suggestion that possibly we might leave out that word by amending the By-Laws and get around all of this trouble, thus preserving all of the benefits and all the rest of it and have all the co-insurance we want to carry. I am sure I would not want to go without other insurance.

DR. A. J. BRADEN: I wish to say that the organization that Dr. Magie speaks of does not cut any figure if they do not appear in the suit, and they did not in the case I spoke of. If they brought their attorney and it was understood that the State Society was behind a man and was willing to fight for him to the last ditch, it might have some influence, but they do not.

DR. J. T. CHRISTISON: My second was simply to bring the question before the House. My remembrance is that last year when the motion was brought up he said that Dr. James of Blue Earth would withdraw if this was continued. Is there any one here who can enlighten us on this matter?

DR. A. G. LIEDLOFF: I am a representative of this Society and during the last year there has been no discussion whatever concerning this matter.

DR. E. W. BUCKLEY: Some three years ago this matter was brought up by Dr. James of the Blue Earth County Society and he even went so far as to threaten to take the matter into court for payment of the amount levied to cover this expense. I took the position at that time, and I still feel the same way as Dr. Magie does, that regardless of whether the individual member of the State Medical Association carries a policy with a protective company or not, he should be willing to join in the mutual defense had in the State Association. Every

member of this Association realizes that in case a verdict is rendered against him he still has the State Medical Association. It is a straight business proposition as to whether he wishes to avail himself of the services of the State Medical Association, who are acknowledged experts, or to employ the services of the attorneys of the company who are not specialists in this work. The first thing that appeals to me is that the man out in the country is sometimes threatened with mal-practice. The first thing he thinks of is to consult an attorney and pay perhaps ten times as much as the payment of the fee to the Association. That in itself appeals to me. The amount is so trivial. If the old-line companies raise their fees to $20, how many would protest against it? It seems to me they get it very reasonably, but the poor devil out in the country who is honest and trying to do what is right by his patients, does not think of the danger he is running and he has no protection whatever if the Association abolishes the protection extended to its members. If he is a member of the State Medical Association, he feels that no other member of the Association can appear against him because turn about is fair play, and any member who appears against another loses cast in the State Society and in his local society, and that to me is enough to warrant carrying it on. If it becomes prohibitive, the question of cost might be considered, but it does not seem to be a question of cost but of policy,—how the thing is carried out when a man is sued. Whether to take the services of the State's attorneys or seek other aid. I do not see why he should not receive the advice of the attorneys of the State Medical Association and why they would not be willing to act in conjunction with the attorneys of other companies. I can see why it is necessary that they ask the entire responsibility of the case. The responsibility rests with them and that responsibility is up to us. We trust them absolutely and, therefore, they should demand exclusive control of the management of the case. It is a question of what does it cost. If you do not wish it, let it alone. It does not cost you much but to have the satisfaction of knowing you are protecting somebody else and that the profession will stand together against these usually malicious suits. That to me is worth three times as much as it costs.

DR. L. A. NIPPERT: I wish to endorse what Dr. Buckley says.

DR. T. H. DICKSON: Within the last two or three days, supposing we accept the proposal and expunge this chapter from our By-Laws, what will be the status of the man against whom suit may be brought next year? He cannot get protection from any insurance company subsequently. Can our officers, if this is stricken out, undertake to pay any money for such action? Would not our members be left high and dry on any question which arises now?

DR. W. G. STROBEL: The Blue Earth Valley Medical Society took a vote on this matter and practically all the members wanted the protection kept up, not for the protection alone but for the moral support that it gives, and practically every member there carries insurance outside. Nevertheless, they wanted this kept up for the moral support. They, furthermore, feel that they do not want the moral support kept up for any man who is guilty.

DR. G. I. BADEAUX: This clause which applies to the sole management of the case has been the clause that has met with criticism in the Upper Mississippi Medical Society. There is considerable misunderstanding and the consensus of opinion up there is that if the Association cannot help we do not care if they do anything at all, because 90 per cent up there carry insurance any way. If that chapter is stricken out as suggested, they would vote to keep the insurance.

DR. H. M. WORKMAN: If we permit the members to select their attorneys, we could not make the assessment great enough to pay for the insurance. The Council a year ago had a little experience of that kind and the fees the attorneys presented ate up a good many hundreds of dollars and if it had gone on it certainly would have wiped out our surplus. I think Dr. Buckley put it right and I do not see how anybody can object. I am now a witness in the Bossingham case. This case originated by one of those ambulance chasing attorneys. Dr. Bossingham delivered a young woman and she had a temperature at the time. He may have been careless in some way; he did not find out why she had temperature at the time of delivery. She progressed and made a fairly good recovery, but afterwards he had a gonorrheal arthritis and she now has an ankylosis of the elbow and is suing the doctor for mal-practice. Two dollars secured his protection in that part of the state and I do not think the profession would have it otherwise.

DR. J. G. CROSS: I question what he says and think I have a pretty good reason for it. I have had something to do with this case to my sorrow and I cannot see why you cannot put in your By-Laws something that will permit the co-operation of other insurance companies with our attorneys. Why can't you do it? There seems to be some feeling on the part of some people. Dr. Buckley says that only by giving the attorneys for our Society sole and entire charge of a case can we hope for protection, but I do not believe that. I have never seen a fair minded attorney yet who was not willing to have counsel and co-operate with other institutions in a case. I should say that the objectional feature, if it is objectionable, could be so arranged that our own attorneys would be willing, I do not know who they are, but think any fair-minded attorney would be willing to co-operate as Dr. Hare says they have been doing in some instances, and make the attorneys of other concerns liable, and so retain all the good features without having the objectionable features which are now found in the state insurance.

THE PRESIDENT: If I understand the situation, the State Society reserves the right to have full charge of a case. I am sure Dr. Cross in a medical case would not wish to accept any consultation people wished to thrust upon him. He reserves the right to accept responsible consultation but no other.

DR. E. W. BUCKLEY: I think Dr. Cross misunderstood me. I carefully refrained from discussing that point for the motion before the House is to strike out this portion, not to qualify it. I said I saw no reason why the attorneys should not accept assistance if they thought proper and Dr. Adair's point is just what I had in mind. Somebody must be in charge. If they are willing to accept assistance that is up to them, but I was not discussing a change in the wording of the present By-Law because I did not understand that that was before the House now. It is simply the question of striking out this chapter in its entirety.

THE PRESIDENT: Has everybody talked on this subject? (Laughter). Anyway, I think you have talked enough. Now then ,the motion is to the effect that the By-Law relating to Medical Defense as contained in Chapter XI be stricken out, and that Chapter XII of the By-Laws entitled "Amendments," be renumbered and known as No. XI. Are you ready for the question?

Several members: Question!

THE PRESIDENT: So many as are in favor of the motion manifest it by saying aye, and remember that a majority vote carries in this case.

One member (Braden) voted Aye. Motion lost.

THE SECRETARY: Pursuant to instructions, the Secretary further moves that Chapter VIII of the By-Laws, Section II, be amended at the seventn line to read as follows: "The House of Delegates shall elect a chairman and secretary for each section. The chairman shall be elected for a period of one year, the secretary shall be elected for a period of two years." This resolution relates to the chairmen of the two sections, namely, Medicine and Surgery. It was introduced by a member of the Section on Medicine, who felt that the secretary would become more efficient the longer he served. Consequently, it was his wish that the secretary be elected for more than one year.

THE PRESIDENT: The section which it is desired to amend reads as follows: Chapter VIII, Section 2. For medical advancement and scientific work the Association shall be devided into two sections to be designated, first, Section on Medicine, second, Section on Surgery, under which shall be grouped the appropriate subdivisions represented by the spectal branches of medicine and surgery respectively. The House of Delegates shall elect at each annual meeting a chairman and secretary for each section. It shall be the duty of the chairman to preside over the meetings of his respective section, and, in co-operation with the secretary of his section, to arrange the program for the next meeting of the Association." The Secretary moves that this be amended as follows: "That Chapter VIII of the By-Laws, Section 2, read, 'The House of Delegates shall elect a chairman and secretary for each section. The chairman shall be elected for a period of one year, the secretary shall be elected for a period of two years.' You have heard the motion, is there a second to it?

DR. J. G. CROSS: I second the motion.

DR. J. T. CHRISTISON: I move an amendment to the amendment, that three be substituted for two years. They become more efficient the longer they serve.

DR. E. H. BAYLEY: I second the amendment.

THE PRESIDENT: The motion is that the secretary be elected for a period of three years and the chairman for a period of one year.

THE SECRETARY: I do not like to appear to do all the discussing, but I believe that this amendment to the By-Laws is not a wise one. I have had some eperience in dealing with the secretaries and chairmen of the sections. If you have a good secretary, it is a wise amendment, but if you have a bad secretary. it is very unwise. There is nothing so difficult in getting up a program that a man cannot get hold of it in one year and after he has served one year he has done his whole duty to the Association for a long time. With that in mind I would be opposed to the adoption of the motion.

Motion voted and lost.

Original motion voted and lost.

THE PRESIDENT: We now come to new business.

DR. A. M. STEWART: Since I have been granted the privilege of the floor I wish to say that Dr. Hill made a statement in the discussion of mal-practice that the statute of limitations runs for six years. I have had some experience with that. One lawyer will tell you it runs two years, another six, and another ten. If you pin him down he will say that he does not know. Could society during the coming legislature get some action on that so that we would know what the statute of limitation is? At present I defy you to go out and find a lawyer who could tell you exactly what it is.

THE SECRETARY: To enlighten Dr. Stewart I will say that I had this very matter up before the last legislature in introducing a bill to make the statute of limitation run for two years. The assistant attorney general for the state said definitely and positively after looking up the law that the statute of limitation at present is six years, and our law which was introduced to limit it to two years last year went into the hands of a committee of attorneys and they killed the bill without a hearing of it. I have been instructed to endeavor to secure the passage of a similar law at the coming session of the legislature and such a law will be introduced in the first week in order to secure a hearing. In most of the states of the union the statute of limitation is two years, but in that respect we are way behind the times and statute of limitation is six years.

THE PRESIDENT: You would not expect any attorneys to cut off their own heads would you?

THE SECRETARY: Not unless they followed the doctors.

THE PRESIDENT: Is there anything else, Mr, Secretary?

THE SECRETARY: I have in my hand a resolution from the National Anesthesia Research Society, which I desire to introduce at this time.

RESOLUTION

WHEREAS the safety of patients, the advance of surgery and the demands of hospital service necessitate the rapid extension of the specialty of anaesthesia, therefore be it

RESOLVED that the Minnesota State Medical Association hereby instructs its Delegates to secure a Section on Anaesthesia in the American Medical Association at the Boston Meeting, June, 1921.

I move its adoption.

DR. F. L. ADAIR: I move that the resolution be tabled. Seconded by Dr. J. T. Christison and carried.

THE SECRETARY: I hold in my hand a resolution adopted by the Ohio State Medical Association at its last meeting held in Toledo, June 1-3, as follows:

Resolution adopted by the House of Delegates of the Ohio State Medical Association, at its last annual meeting, held in Toledo, June 1, 2, and 3, 1920:

"Whereas, in our forty-eight states there are as many separate medical examining boards, and

"Whereas, licensed physicians in one state may not always practice in other commonwealths without vexatious examinations and expense, and

"Whereas, the government in time of war fre quently sent physicians into army camps in other states, and therefore disregarded state boundaries, and

"Whereas, there is practically homogeniety in the anatomical and phychological makeup of the people in the various states, and

"Whereas, the same may be said of the physicians throughout the land.

"Therefore, Be It Resolved, that it is the opinion of the House of Delegates that the right to practice in one state should be extended to include the right to practice medicine in any part of the United States.

"Be It Further Resolved that a copy of this resolution be sent to the proper officials of all medical societies, and to national and quasi-national medical associations, and that the American Medical Association be especially urged to perfect a plan by which interstate medical practice be made as easy as interstate commerce."

THE PRESIDENT: What will you do with this resolution as read by Dr. Hare, or will you do anything with it?

DR. F. L. ADAIR: I would like to ask by what means we gain in this connection. That is a matter for state regulation and can only be accomplished by action of each state.

DR. R. E. FARR: I move that it be laid upon the table. Seconded and carried.

THE SECRETARY: I now have a matter which is, I think, of rather more importance to this Association than the two just proceeding. The matter deals with the Minnesota Public Health Association. I hold in my hand the constitution and by-laws of this Association. I do not wish to read them but I do wish to introduce them and have them referred to the Committee on Public Health with instructions to report back to this House of Delegates at its meeing Friday morning. We have been asked to appoint a representative on its central committee, who will represent the State Association, and if it be worthy of consideration I hope it will be referred to the Committee on Public Health, they to report back on Friday morning. I move, Mr. President, that this communication be referred to our Committee on Public Health.

DR. R. E. FARR: I second the motion. Carried and so ordered.

THE SECRETARY: Mr. President, the Secretary now moves that the annual dues of the State Medical Associatian be advanced to five dollars per member. Seconded by Dr. J. T. Christison and carried.

I now move, Mr. President, that at the time of election of officers a secretary who shall be a member of the Association be elected, and that an executive secretary, a layman, be provided for, who shall give his entire time to the conduct of the business of this Association in order that it may be carried out in a business-like way.

DR. H. M. WORKMAN. I second the motion, but think we should have an amendment to provide for a Secretary-Treasurer all in one.

THE PRESIDENT: You have heard the motion as introduced by Dr. Hare with reference to a second or executive secretary. Is there any discussion?

DR. R. E. FARR: The Editing and Publishing Committee have been discussing just this particular thing and while we have not formulated any plan, we have as a suggestion for consideration a scheme which might work out. This matter of Minnesota Medicine, for instance, and setting aside two dollars for the journal is purely a matter of form, because the journal is a matter of asset or liability for the Society, depending upon whether it wins or loses, and this must be understood by the Society. A great deal of clearical work is necessary in connection with Minnesota Medicine and stenographer hire is a part of our expense, and not an inconsiderable part. The question arises as to whether we might not use a book-keeper and stenographer jointly to work on Minnesota Medicine and also do the work that Dr. Hare has designated, and in that way cut down the expenses to some extent. If we have time to consider that, I think it would be well to think it over and have it investigated before we act upon it. The Secretary has his list of the State Society and Minnesota Medicine has a list. They have to be corrected by one and sent to the other and a great deal of the work is a duplication. I believe we could cut down about 50 per cent of our work. We might also have this individual act as sort of a manager for our State Society, to go ahead and arrange for the meetings and take over the clerical work of getting out cards and handling things for the meeting of the State Association. He or she might go a week before hand, she would be in the office of the Journal, and it seems to me it would make our Association and its management more homogenous.

THE SECRETARY: I rise to support this motion because of the experience I have had. We now have 1548 members. We are a large corporation but we are without a business manager. It is unreasonable to expect a practicing physician to devote the time necessary to the conduct of the business of this Association. I want to tell you it is a hard job. It is unreasonable to expect any physician to devote that amount of time and take it away from his work, in which he is more efficient and in which he is interested. The stipend which is allowed for the office of the Secretary is simply an aggravation. My secretary has work all the time as hard as she should be worked and it devolves upon your Secretary to work nights and Sundays on clerical work with which he got through 25 years ago. It seems to me that even unbusiness-like men, as doctors are, ought to see the reason for conducting their business along business lines, and the resolution contemplates not only delegating the work to somebody else but the formation of a medical society that will be a credit for the reason that this individual if properly selected can conduct the business of the Association in a way that will make the Association a credit to the doctors of the state, and make us a powerful organization among the societies of the United States. It will cost us something, of course, but we cannot get a secretary in any easier way than in the one just outlined; namely, by having 1548 men contribute toward the support in order that this person may be provided. I am not anxious that this be concluded today, so I move that the motion be tabled to be considered on Friday morning.

DR. J. T. CHRISTISON: As a member of the Editing and Publishing Committee I wish to emphasize what Dr. Farr says. In talking this over with our manager, Mr. Bruce, we had a more or less fantastical sort of plan, which if you can give us a day or two to work it out, we can bring before you on Friday morning. We can then have something definite which will lead to some tangible results. It is necessary that we have some one to do the secretarial work who is not in active practice.

DR. T. H. DICKSON: Is it proposed to create a new office or authorize the payment of a secretary?

THE SECRETARY: My idea is that we have an office which shall be known as the office of the Minnesota State Medical Association. Letters come now to the Lowry Building in St. Paul and they are forwarded to me in Minneapolis and I send them back. The communications to the Medical Association are just being sent that way all the time from one city and one building to another. We should have an office where the communications could come and that should be known as the office of the Minnesota State Medical Association and that would stand for something. By and by we might have a building of our own, but unless we get somebody in power who can devote enough gray matter to the affairs of the Association for us to advance, we will never get anywhere. That is what I have in mind. It is idealistic, of course. That is what I would like to see done and have the affairs of the Association run in a business-like manner.

DR. T. H. DICKSON: I am in accord with it, but think we are going at it the wrong end to. If we are authorizing a new officer, it should come before the Association. If it is simply a secretary, we should authorize such action by the House of Delegates.

THE SECRETARY: I do not care how he or she is appointed. He may be elected by the House as executive secretary.

DR. R. E. FARR: I rise to a point of order. There is no motion before the house and I wish to make one.

THE SECRETARY: You are mistaken, there is a motion seconded by Dr. Christison, that the motion be tabled until Friday morning.

Motion voted and carried.

DR. R. E. FARR: I move that a committee of three be appointed by the Chair to consider the matter and report at the Friday morning meeting. Seconded by Dr. Hare and carried.

THE PRESIDENT: I will appoint the following

committee: Dr. Hare, Dr. Farr, and Dr. Workman.

Have you anything else to present Mr. Secretary?

THE SECRETARY: I wish to infringe upon the time of the delegates for just a moment and read a letter which I received several months ago. I wish to read it because I want it to become a part of the records of the Association. The letter is as follows:

Pomona, Cal., March 20, '20.

Earle R. Hare, M. D., Secretary,
Minnesota State Medical Associatlon:—

My Dear Doctor:—Your letter of the 12th inst. informing me that the Minnesota State Medical Associatlon had elected me to an Honorary Life Membership, was received as a happy surprise. I wish through you to thank the Association for this great honor bestowed.

My long years of service as a physician in Minnesota commenced in the fall of 1853, and terminated June 1904—more than half of a century. Seven years of which was in the Government service on the Frontier, at Fort Ridgely and the Lower Sioux Agency. With a population of more than six thousand Indians within fifty miles of these points, stirring incidents were of frequent occurrence, but they would be out of place in this letter, therefore only a brief outline will be given.

While at Fort Ridgly, June 1854, for an amputation, I gave chloroform, probably it was the first given in the Terrltory, and during my time at the Agency the Ink-pa-dutah war at Spirit Lake March 1, '57, some service was rendered. Surgical work was considerable, as it lncluded operations at Fort Ridgly and the Agency at Yellow Medicine. The Indians were kept vaccinated, and treatment given to such as preferred it to conguration. The Civil War commenced 1861, when I resigned my position at the Agency, located at Peter, a frontier town of fifteen hundred inhabitants, expecting to go into our army sooner or later, as opportunity offered.

1862 the Sloux Outbreak occurred, and as surgeon to Flandreau's command, I served in the defense of New Ulm. The wounded of that battle were mostly brought to St. Peter, and were in my care until recovery. During the Civil War on several occasions, I examined recruits for service south, and also, did local hospital service.

My professional life at St. Peter was a strenuous one, and extended over three or four counties.

On retiring from my arduous work, the citizens in appreciation of my long and honorable service, presented me with a beautiful Silver Loving Cup and a congratulary address.

Thank you, dear Doctor, for the kindly sentiment expressed in your note. At ninety-one I am still very well and rapping out on the typewriter this note, expressing my gratitude to the Minnesota State Medlcal Association and yourself.

Very truly yours,
A. W. Daniels, M. D.

DR. W. F. BRAASCH: I move that the letter be incorporated in the minutes of the House of Delegates. Seconded by Dr. R. E. Farr and carried.

THE PRESIDENT: Is there any further business to come before the House of Delegates at this time? If not, a motion to adjourn until some specified time is in order.

THE SECRETARY: I move that we adjourn to meet in this room at 10 o'clock Friday morning. Seconded by several members and unanimously carried.

PROCEEDINGS OF THE HOUSE OF DELEGATES OF THE MINNESOTA STATE MEDICAL ASSOCIATION

FRIDAY, OCTOBER 1, 1920.

The House of Delegates met pursuant to adjournment at 10 o'clock a. m., in the Windsor Room, St. Paul Hotel, St. Paul, Minnesota, President J. H. Adair, presiding.

THE PRESIDENT: The House of Delegates will be in order. Has the Credentials Committee any further report to make?

DR. E. W. BUCKLEY then announced the following changes and additions:

SOCIETY	DELEGATE
Wabasha County	E. H. Bailey
Scott-Carver County	H. W. Reiter
St. Louis County	E. M. Z. Shapiro
Aitkin County	A. J. Braden
Goodhue County	N. H. Gillespie
	E. W. Kelly
	J. A. Gates
Lyon-Lincoln County	W. H. Valentine in place of E. T. Sanderson
Olmstead County	A. F. Kilbourne, alternate for W. H. Witherstine
Ramsey County	C. N. Hensel, alternate for F. E. Burch

Upon motion of Dr. Buckley, duly seconded and carried, Drs. Valentine, Kilbourne and Hensel were seated as delegates.

THE PRESIDENT: The next order of business will be the reading of the minutes of the last session.

The minutes of the last session were read by the Secretary.

THE PRESIDENT: You have heard the report of the last meeting, as read by the Secretary. Are there any corrections or amendments to the report as read? If not, a motion to adopt will be considered.

DR. J. T. CHRISTISON: I move the minutes be adopted as read.

Motion was seconded and duly carried.

THE PRESIDENT: I think we will complete the unfinished business of the last session, and the first in order will be the report of the committee to formulate a plan for a reference committee system. Is that committee ready to report? There being no response from the committee we will consider now the report of the Committee on Public Health, which also was to report at this session. Dr. Smith is the chairman of that committee.

DR. C. E. SMITH: There was referred to this committee a communication purporting to come from the Minnesota Public Health Association, but on investigation we find that the request is from the Minnesota Central Health Committee to the effect that the Minnesota State Medical Association send two delegates to that committee. In line with the recommendation made yesterday that the Minnesota State Medical Association as an organization should interest itself in the public health movement in Minnesota, your Committee respectfully recommends that the requested two delegates be sent from this Association to constitute its representation in this Central Health Committee. The Central Health Committee is a committee of delegates from all the medical and health organizations in the state, and its purpose is to acquaint the delegates and through them the various component societies with what is being done in the public health movement. It aims to do away with misdirected effort and lack of correlation, and while it has been in a state of innocuous desuetude since May, it is believed it would be a very good thing to have the Asssociation represented on that

Committee. Your Committee suggests that as one of these delegates the Chair appoint the Secretary.

THE PRESIDENT: You have heard the report of the Committee on Public Health to the effect that a committee of two from this Association be appointed as delegates to the forthcoming meeting of the Central Health Committee of this state. What will you do with the report of this Committee?

DR. J. T. CHRISTISON: I move its adoption.

The motion is duly seconded.

THE PRESIDENT: It has been moved and seconded that the report of the Committee be adopted. Is there any discussion?

DR. J. G. CROSS: Would it not be well to understand the constitution of this Central Health Committee? I never heard of it.

THE SECRETARY: You will find the constitution attached to these papers.

THE PRESIDENT: Are you ready for the question?

THE SECRETARY: The Secretary might state that some months prior to this time he received a communication from the Secretary of this Committee requesting that he meet with the Committee, and he did so do. The idea seems to be to hold periodic conferences with representatives from various associations interested in the advancement of public health work, in the hope that if each association is informed what the other associations are doing there will be a limitation in a marked degree of the overlapping of the work of these bodies and an intelligent effort made to correlate their work. It is simply a representative body of men and women to get together for conferences in the state in order that they may go back to their respective associations with a more intelligent idea of what is being attempted in the line of advancing public health.

THE PRESIDENT: Any further discussion on this motion? If not, are you ready for the question? As many as are in favor of the motion say aye; contrary-minded no. The motion prevails. The next order of business will be the report of the special committee consisting of Drs. Hare, Farr and Workman with reference to the appointment of a Secretary to assist in the work of the Association in connection with the publication of "Minnesota Medicine". Dr. Hare.

THE SECRETARY (Dr. E. R. Hare): Mr. Chairman, after consideration of the subject in hand, the Committee desires to report as follows: That an executive secretary be secured, same being nominated to the Council by the Secretary for their election or approbation, a Secretary whose duty it shall be to devote his entire time, or as much thereof as shall be necessary, to the service of the Minnesota State Medical Association in the office of the Association, the keeping of the records of the Secretary and records of "Minnesota Medicine". The Committee moves the adoption of the report.

DR. R. J. HILL: Where is the office of the Association?

THE SECRETARY: That is to be determined.

THE PRESIDENT: You have heard the motion of Dr. Hare concerning the adoption of the report of this Committee. What will you do with it?

DR. F. R. WEISER: I move its acceptance and adoption.

The motion was duly seconded.

DR. J. A. GATES: This does not say anything about what salary or anything like that; who regulates that?

THE SECRETARY: The Council.

THE PRESIDENT: It is simply referred to the Council for their action. We recommend this to the Council.

DR. J. A. GATES: This is recommended by this House of Delegates to the Council and they have full power to act?

THE PRESIDENT: That is my understanding.

DR. J. A. GATES: Cannot we have any idea of about how much that expense will be?

DR. H. M. WORKMAN: I think the cost will be less, certainly will not exceed the present cost. It does away with the salary now paid the Secretary and it does away with the Secretary's office expense. By having an executive secretary we may be able to save from two to three or possibly more hundred dollars, and certainly it would be advisable.

THE SECRETARY: It seems to me that the primary consideration here is not a consideration of the saving of a few dollars in this Association business. The primary consideration is the efficiency in the conduct of the business of the Association. If we are not efficiently managed we are not willing to pay for it, but if we are efficiently managed we are willing to pay anything that is reasonable for it; but certainly we will be able to conduct the business of the Association in a far superior manner if we concentrate in one office what is now distributed in two or three offices.

I am not quite so optimistic as some of the rest of the members of this Committee with reference to the expense. I feel that the expense will be equivalent, at least, under this new regime to what it is now. It may be less, it may be a little more. But even so, if our business is efficiently taken care of at the time it should be taken care of, not only that but if we are able to have an executive who will allow his thought to ramify out into the proper and legitimate paths that it should and endeavor to conduct the real business of the Association, we ought to be advanced one hundred per cent the first year in efficiency in the conduct of this Association and make it an Association that will really be recognized as the very first Association in medicine in this state. There is no reason why we should not be far and above every other Association in the state, and if we are efficiently managed we will be. It seems to me that all we need is the facts in the matter to make us see it in the right way and get behind it as a unit and push it to a successful conclusion.

DR. J. A. GATES: I quite agree with the Secretary upon this proposition, but I wanted to bring out a little information what this was. When a motion is put up and it is not explained, one rather wonders what is going on. This is the place where those things should be threshed out and my question was not in opposition.

THE SECRETARY: I understand.

DR. J. A. GATES: As he explained it I am very much in favor of it, but I think these things should be discussed here.

DR. T. H. DICKSON: What is the status of this thing? Are we considering the acceptance of the recommendations, is that the status of the question before us, or are we acting on a motion?

THE PRESIDENT: A motion is before the House and it is open for discussion.

DR. T. H. DICKSON: Is that to adopt the report?

THE PRESIDENT: The motion is to adopt the report of the special committee.

DR. T. H. DICKSON: I think all we need to do is to authorize the council to employ such secretary and leave the emoluments and responsibility with the Council. If we adopt a specific sum the Council cannot go beyond that. If we leave it to the Council and authorize them to employ such officer it seems to me that would be the better arrangement.

DR. R. J. HILL: I understand in the original motion which was made at the former meeting this was to include the treasurer.

THE PRESIDENT: That was not seconded.

DR. R. J. HILL: I see no reason why, in line with Dr. Hare's remarks, a treasurer should not also be appointed and thus do away with the office of the treasurer as an official.

THE PRESIDENT: Any further discussion on this motion?

DR. C. N. HENSEL: It seems to me that if we elect an executive secretary, or give the present secretary an executive secretary, we do that to help him in the conduct of the affairs of the office, and that we ought not to hamper him in any way. So I would feel, as Dr. Dickson has spoken, if the motion is made simply to allow the association to hire an executive secretary, that is sufficient, and there is no hampering. There is no specification as to where the office of the association should be or any other conditions that would bind him in any way, and it seems to me that would give him more freedom and it would lead to a better arrangement than a specific recommendation.

THE PRESIDENT: As the chair understands this matter it is the purport of this report to merely make this recommendation in general terms and pass it up to the council where it must finally be disposed of. I do not think the Council will be hampered or restricted by anything that is embodied in the report of this special committee. Are you ready for the question?

Upon being put to a vote the motion was carried.

THE PRESIDENT: Dr. A. S. Hamilton, of Minneapolis, requests the privilege of the floor for a few moments in order to present a matter of considerable importance, and if there is no objection on the part of this house I would ask that Dr. Hamilton be granted the privilege of the floor for that purpose. Is there any objection? No objection being stated I will ask Dr. Hamilton to come forward and present his matter.

DR. A. S. HAMILTON: May Dean Lyon be permitted to speak a moment, first?

THE PRESIDENT: I think the same thing will apply to Dean Lyon.

DR. E. P. LYON: Mr. Chairman and Delegates: Dr. Hamilton and I are here from the medical school to ask this body to consider and, if you deem it wise, to recommend the establishment of a psychiatric clinic on the University campus. Such a project has been under consideration in this state informally for a number of years. It has twice been recommended in the reports of the board of legislative visitors, it has been approved by the faculty of the medical school but in some way it has never been brought up to the bodies whose cooperation must be obtained for its acutally being carried out, namely, the Board of Regents of the University and the State Board of Control.

It is our purpose immediately to bring the matter before these two bodies and to work out the details under which such a clinic would be effected because, as I say, it would have to be a cooperative venture between the two bodies, the University and the State Board of Control. Dr. Hamilton will tell you the details of the project and the precedents in favor of it better than I can.

I will mention only three reasons which occur to me upon the moment which appear to me to be potent and important in influencing you in this matter. First it occurs to me,—I don't know as it is first in importance, but it is a reason that occurs to us as medical educators,—that medical students ought to have better training in the large class of mental diseases which are becoming more important than previously and in which students ought to be trained.

The second purpose of such a clinic is to serve as a clearing house, where cases from twin cities and perhaps from even a wider territory would be accumulated and considered before being passed on to other hospitals which the state maintains. There is need for such an institution in connection with these large cities.

The third, of course, is from the standpoint of the patient himself, because in many cases injustice would be saved if a patient were simply known to have been at the University hospital instead of some of the state hospitals.

Presenting these three reasons why such an institution should be formed, I will ask Dr. Hamilton to discuss more in detail the exact conduct of such an institution, and I know he will be willing to answer any questions you may wish to ask. I hope you will consider the matter, and if you find it wise to give us your endorsement it will be of great importance to the University and, I believe, also to the state.

THE PRESIDENT: Dr. Hamilton.

DR. A. S. HAMILTON: Mr. Chairman and members of the House of Delegates: As one connected with the teaching of the subject of mental diseases at the medical school, I am very much interested in the subject now in hand. I need not argue to you the necessity for clinical material for teaching psychiatric subjects, but perhaps you are not aware of our lack of clinical material. To provide this you would need a hospital designed primarily for this purpose, and if by any chance or by dire necessity a mental case comes in it is promptly shipped off to the state hospital as quickly as it can be done.

This situation has been met by Michigan some years ago by developing a psychopathic hospital, a hospital containing seventy beds. The example has been followed by Harvard, John Hopkins, New York, California, Missouri, Illinois, Iowa and Colorado, perhaps I haven't them all, all which have in more or less of a completed state an institution of this kind. We are far enough behind in Minnesota, we do not want to get any farther behind.

The objects of an institution of this kind are about as follows. In the first place, we want clinical material for teaching purposes. We feel that the subject of mental diseases should be as well supplied with clinical material as every other important branch of medicine, as good as any school in this country that is worth anything. We want to develop a corps of nurses who are trained in hospital service in the care of mental cases. We want an institution where we can take part in the investigation of the problems of mental diseases. We want a psychopathic laboratory which will be for the use of the state at large as well as the University itself.

These are some of the purposes of such an institution that ought to appeal to physicians. There are other purposes that this institution could fill. We want to develop an out-patient service, so that mental cases can be seen in their incipiency, and whatever can be done will be done there. We want this out-patient service to develop methods of prevention, and so forth. We want this institution for those purposes. Almost all the advanced juvenile courts at the present time are depending very largely on the study of the juvenile delinquents by people experienced in the study of mental conditions and mental degeneracy and we want that aid for the advancement of this study.

This is a brief statement of the reasons why we want this thing. It has been recommended by the State Board of Legislative Visitors. I cannot say it is supported by the Board of Control because that would require official action but I think the members are in support of it. If there is any doubt of it Drs. Kilbourne and Hill are here. Dr. Kilbourne has more than once officially recommended this thing for the University. They can express the views of our state hospital authorities.

THE PRESIDENT: Does the House of Delegates wish to take any action at this time upon the recommendation of Drs. Lyon and Hamilton, and if so, what?

DR. A. F. KILBOURNE: I do not want to take up the time but I endorse everything that Dr. Hamilton has said. It is a serious handicap for a great institution like the University not to have a pyschopathic hospital. It is something that is greatly needed in the teaching of students there. Much suffering can be prevented by proper treatment. If the patients are going to get well most of them get well inside of, I might say, three months or six months, and if they can be taken in hand early it would certainly be of great advantage.

Another thing, a great many cases, as the doctor says, can be cleared, this acting as a clearing house, obviating their transportation a hundred miles to the state institution. If there is not a psychopathic hospital there should be a hospital for the insane near the Twin Cities, where sixty per cent of the insane at St. Peter and Rochester come from. I heartily endorse everything that Dr. Hamilton has said. I do not speak officially as a member of the Board of Control, but I am quite positive they are in favor of this movement and will do everything to back it up. We have a clinic at Rochester every week from the files of the Mayo clinic. There is no reason why the University of Minnesota should not be abreast of the University of Michigan and John Hopkins.

THE PRESIDENT: Any further remarks on this question?

DR. A. F. KILBOURNE: Is there a resolution before the house?

THE PRESIDENT: There is nothing before the house.

DR. J. T. CHRISTISON: Mr. President and Gentlemen: I am not going to speak as a member of the faculty of the State University but in behalf of an institution here in St. Paul. We established under the supervision of the Ramsey County Public Health Association in our free dispensary work some time ago, a psychiatric clinic. The National Society for Psychical Research sent us a trained social worker and that society paid her salary, for one year. If you do not do anything else in the psythiatric clinic than take care of backward children, you are going to accomplish something that is really worth while.

You are all familiar with the fact that many of these backward children, if taken in hand early and properly cared for, with a social service department at their backs, can be made to accomplish many, many things, enough, at any rate, to enable them to grow up and develop what mentality they have and become useful members of society. We think our psychiatric department is one of the most important and one of the best in the free dispensary.

Dr. Lyon spoke of the conditions at the University of Michigan. When I was a student there we used to be taken up to Pontiac semi-occasionally for our neurological studies. Perhaps some of you remember that. Now they have on the campus a psychopathic hospital which gives the student every advantage that can be attained by any hospital. Their cases are selected and they are properly cared for, and the students are assigned to that work just the same as they are assigned to any other of their hospital work. It is a crying shame that the University of Minnesota is so far behind in this respect.

DR. J. G. CROSS: There is no motion before the house.

THE PRESIDENT: I was about to remark that we are rather "fanning the air". There is nothing before the house and unless we propose to take some action in the matter we are wasting time.

DR. J. G. CROSS: I would like to make a motion, Mr. President, that the House of Delegates endorse in general the plan of the psychopathic hospital in Minnesota. Speaking on that motion, I do not know that I am fully committed to the notion that such a psychopathic hospital or observation clinic should be a part of the state hospital system rather than just a University hospital. I would like to know whether that would not be the more efficient organization of such a hospital, whether it is on the University campus or not.

THE PRESIDENT: Let us have your motion, Dr. Cross, so we will get this thing definite.

DR. J. G. CROSS: It was as simple as it could be made. My motion was that we endorse the plan of the Minnesota psychopathic hospital or observation clinic. I am aware that is not very clearly put; my idea was to get it before the house.

The motion was seconded.

A MEMBER: We could not hear what he said.

THE PRESIDENT: In general terms Dr. Cross' motion was that this House of Delegates endorses the idea of a psychopathic hospital and he leaves it right there. Is there a second to that motion or Dr. Cross'?

The motion was again seconded.

THE PRESIDENT: It is moved and seconded that this House of Delegates endorse the idea of a psychopathic hospital. Is there any discussion upon this motion?

DR. B. W. KELLY: I am sure Dr. Cross intended the psychopathic hospital should be located on or adjacent and convenient to the University campus.

THE PRESIDENT: Well, I do not recall that Dr. Cross said so.

DR. B. W. KELLY: I think that should be understood. That is the natural location for it and is the location as suggested by Dr. Lyon. If we make any recommendation at all it should be understood plainly that the House of Delegates endorses the idea of a psychopathic hospital as a new and very much needed feature of University work.

DR. A. F. KILBOURNE: I would like to move, in addition to Dr. Cross' motion, that this psychopathic hospital be in connection with the University.

THE PRESIDENT: Do you accept that addition?

DR. J. G. CROSS: If Dr. Kilbourne makes it, I would be glad to accept it.

DR. J. A. GATES: It seems to me we have not gone far enough in this motion. The motion is to recommend, but whom are we recommending it to? The recommedation seems to me, ought to be directed to the University Regents. Unless it is directed to some authoritative board the recommendation does not mean much. I believe the idea is a good one and we ought to put it in the most effective way. I would like to add to that motion that this recommendation be directed to the Board of Regents of this state and the State Board of Control.

DR. E. W. BUCKLEY: It seems to me it is a good thing, but I would like to have Dr. Cross change the wording of it. I am going to vote in favor of it, but I would like to have it changed to read that we strongly urge the establishment of a hospital of this character in connection with the medical school of the University of Minnesota, and so recommend to the Board of Regents.

THE PRESIDENT: It seems to me that the only thing for Dr. Cross to do is to go out and tie a wet towel around his head.

DR. J. G. CROSS: I made that motion purposely as I did because I do not believe this body has any standing which would entitle it to emphasize very much more than simply endorse an idea which we thoroughly believe in. We know it is a good thing and we want it. However, I am not at all clear as to

whether the recommendation of Dean Lyon and Professor Hamilton means that this matter will be under the Board of Control or Board of Regents. I do not know how it will be co-ordinated with the state hospital or insane hospital system. I think the manner of working it out will have to be left to some other body than the House of Delegates. I am entirely in sympathy with such a psychopathic clinic being established at the University of Minnesota and under the control of the University, if it co-ordinates perfectly in the matter of efficiency, records, and so forth with the system of insane hospitals in Minnesota. But that system is a going concern, one which should not be interferred with unless to its betterment. This is a distinct addition to that organization and I imagine it would have to be very carefully considered by some one more competent to do it than the House of Delegates at this session. Therefore I beg leave to let it remain as it stands.

DR. J. A. GATES: I move you that all pending motions be laid on the table and that Dr. Lyon and Professor Hamilton be requested to present a written motion as to what they want this House of Delegates to do.

The motion was duly seconded.

THE PRESIDENT: That motion is ruled out of order for the reason that Dr. Lyon and Professor Hamilton are not members of this House of Delegates.

DR. J. A. GATES: Then I substitute in place of those two gentlemen, Dr. Buckley.

THE PRESIDENT: I do not know, you may ball me up most terribly and you may go against it, but I have a hunch that I will make this kind of a ruling. I may be wrong. I will rule that the only question to be considered at this time is the very simple motion of Dr. Cross that we endorse the idea of a psychopathic hospital in connection with the University.

(Cries of "Question, question.")

DR. H. M. WORKMAN: Just one more point. I am in favor of it and should it carry I think it should provide for a free bed hospital where no man can take paid patients. If it is a free bed hospital I am in favor of it.

DR. F. L. ADAIR: I want to present a substitute motion which has the endorsement of Drs. Lyon and Hamilton. The House of Delegates of the Minnesota Medical Association strongly recommends to the Board of Regents that action be taken leading to the establishment of a psychopathic hospital to be located on the University campus and conducted as part of the University Hospital system.

THE PRESIDENT: You offer that as an amendment to Dr. Cross' motion?

DR. F. L. ADAIR: As a substitute motion.

THE PRESIDENT: Are you ready for the question on the substitute motion? As many as are in favor of this motion say aye; contrary-minded, no. It is a vote.

DR. J. A. GATES: It will be necessary to put the original motion.

THE PRESIDENT: I understand so. You are now to vote upon the original motion as presented by Dr. Cross. (Voices "No, no") You are voting on the motion as substituted. As many as are in favor say aye; contrary-minded no. It is a vote.

DR. E. P. LYON: I want to heartily thank you for your action.

THE PRESIDENT: The next order of business is the election of officers. Are you ready to proceed with the election of officers? We will first consider the election of the president.

DR. J. T. CHRISTISON: It is with a great deal of pleasure I arise now to nominate a man for president of this association whom we all honor and respect. His attainments in the medical world are such that it ill becomes me even to speak of them. His name is everywhere a household word wherever the subject of neurology is broached. I place in nomination for the office of president the name of Dr. C. Eugene Riggs, of St. Paul, the well beloved.

DR. H. M. WORKMAN: I second the nomination of Dr. Riggs.

THE PRESIDENT: Are there any further nominations?

DR. F. R. WEISER: There being no further nominations I move that the nominations be closed and that the secretary be instructed to cast the ballot for Dr. Riggs.

The motion duly seconded and carried.

THE SECRETARY: The secretary hereby casts the vote of this House of Delegates for Dr. C. Eugene Riggs, of St. Paul, for president of the Minnesota Medical Association for the ensuing year.

Dr. Arthur N. Collins, Duluth, was nominated for first vice president; Dr. F. B. Strathern, St. Peter, second vice president; Dr. W. A. Hunt, Northfield, third vice president. There being no other nominations the secretary was in turn instructed to cast the ballot for each of the above named gentlemen for the respective offices, which was done, and they were declared elected.

The secretary, Dr. Hare, placed a nomination for the office of secretary for the ensuing year, Dr. Carl B. Drake of St. Paul, and there being no further nominations, he was instructed to cast the ballot of the delegates for Dr. Drake. This was done and Dr. Drake was declared elected. On motion of Dr. John E. Hynes, Minneapolis, Dr. F. L. Beckley was renominated for the office of treasurer and there being no further nominations, the secretary was instructed to cast the ballot for him. This was done and Dr. Beckley was declared elected.

The following officers were then duly elected. Councilor sixth district, Dr. F. R. Weiser, Windom, (re-elected); delegate to American Medical Association for two years, Dr. W. H. Magie, Duluth, alternate for two years, Dr. J. L. Rothrock, St. Paul.

Dr. M. H. Gillespie, Duluth, extended an invitation to the association to meet in Duluth next year, and upon motion duly seconded and carried the invitation was accepted.

THE SECRETARY (Dr. Hare): The secretary moves that the president-elect be authorized to appoint all of the committees under the constitution and by-laws for the ensuing year.

The motion was duly seconded and carried. Upon motion that President Adair appoint a committee of two to apprize Dr. Riggs of his election and have him present at the joint session of the two sections in the afternoon, which was duly seconded and carried, the chair appointed Dr. Christison of St. Paul and Dr. Weiser of Windom.

DR. A. J. BRADEN: I would like to ask a question. It has been customary when we met at Duluth to meet earlier; I do not know what the provision is in the constitution.

THE SECRETARY: The council can arrange that.

THE PRESIDENT: Is there any unfinished business?

DR. H. M. WORKMAN: Inasmuch as the committees were to report and failed to do so this morning, I would like to move that those committees be instructed to send their reports to the council so they can be acted upon, and if they are acted upon favorably that the incoming president can appoint such committees; Dr. Head's recommendation and all those matters.

THE PRESIDENT: It is moved by Dr. Workman that the special committee to formulate a plan for a reference committee system which was to re-

port at this meeting and which so far has failed to report, be instructed to present that report when completed to the council for their consideration. Is there a second to that motion?

The motion was duly seconded and carried.

THE PRESIDENT: Any further unfinished business? Any new business?

DR. W. H. VALENTINE: In view of the fact that in the past there have been more or less organized efforts of societies, etc., to offer to the public medical and surgical services at a reduced rate, and that at the present time there is a wide movement under the heading of health insurance being agitated along the lines as carried on in Europe, I want to call attention to the following. I hold in my hand a clipping from a morning paper which states that "Four thousand doctors of Vienna, who have been treating patients under the auspices of sick benefit associations, have gone on strike. They are refusing to make visits except for the regular fees of their private practice."

I believe this movement will have a tendency to cut our fees, and I wish to offer the following resolution:

Resolved by the House of Delegates of the Minnesota State Medical Association in annual session assembled, that after most carefully considering the experience of foreign countries under social insurance and with a due regard to the investigation and findings of the society's committee on the subject, we unqualifiedly declare ourselves opposed to the introduction of any system of so-called compulsory health insurance into the state of Minnesota as contrary to the best interests of the patients, the general public, and the practice of medicine as a healing art.

I move the adoption of this resolution.

The resolution was seconded.

DR. A. G. LIEDLOFF: Our county society took some action with regard to a resolution which was adopted at our last meeting, but they carried it a little further, in desiring that we unite with the dental association to discourage social insurance. So I would move you that a committee from this association cooperate with a committee from the dental association to oppose social insurance.

THE PRESIDENT: You offer that as an amendment?

DR. A. G. LIEDLOFF: Yes, sir.

THE PRESIDENT: Do you accept that amendment, Dr. Valentine?

DR. W. H. VALENTINE: Yes.

Upon being put to a vote the motion prevailed and the resolution as amended was adopted.

THE PRESIDENT: Is there anything further?

THE SECRETARY: The secretary believes it would be well for us to pass a resolution of thanks to our visitors from abroad, the gentlemen who have come and helped to entertain us at this session. Will you offer such a motion, Dr. Buckley?

DR. E. W. BUCKLEY: Dr. Hynes suggested an amendment in regard to Ramsey county which puts me in an embarrassing position. I think it ought to come in a separate motion. I would move that the thanks of the Minnesota State Medical Association be extended to the members of the profession and to all who contributed so generously and so effectively to the entertainment of the Minnesota State Medical Association.

THE SECRETARY: I second the motion.

THE PRESIDENT: It has been moved and seconded that a vote of thanks as stated by Dr. Buckley be extended. Those in favor say aye; contrary-minded no. It is carried.

DR. J. E. HYNES: I move that the thanks of the House of Delegates be extended to the Ramsey County Society for the bountiful hospitality and entertainment we have enjoyed at their hands during the convention.

The motion was seconded and carried.

THE SECRETARY: The secretary wants to add his personal thanks for the cooperation of the committee of arrangements of the Ramsey County Medical Society, and he desires further to state that, so far as he knows, that we have had the largest registration of any meeting ever held by the Minnesota Medical Association.

THE PRESIDENT: It is a good time for you to quit.

THE SECRETARY: It is up to the next secrtary to beat it. The secretary desires to read from the minutes of the American Medical Association one paragraph, which deals with the report of the council to the House of Delegates, this being a recommendation. "That the work of the committee on health problems in education be endorsed, and that the secretary of the council be instructed to ask the secretary of each state association to have a committee appointed to attend the next meeting of the State Teachers' Association and to ask for the appointment of a committee from the State Teachers association to cooperate with the medical profession in promoting better health conditions in our public schools."

DR. J. T. CHRISTISON: I move that such a committee be appointed by the incoming president.

The motion was seconded and duly carried.

THE PRESIDENT: Any further communications? If there is no further business to come before this House of Delegates, a motion to adjourn will be in order.

DR. E. W. BUCKLEY: Mr. President, I want to make this one announcement. I do not know whether it will go through or not. At the time of the peace treaty was signed between Germany and the other nations with whom it has been at war, a provision was put in the treaty requiring Germany to deliver to each nation a certain amount of drugs at prewar prices. All other nations availed themselves of that provision except the United States. During the first part of August, just before I left for France, I was approached by a representative of the state department and advised that this provision of the treaty had not been accepted by the United States but that the organization which I represented would be given the privilege of taking over that contract. It represents at present about two million dollars. The time limit, however, expires on the 9th of December. at least, so we were informed. On the 7th of December we accepted that contract, which provides that no profit can be made from the sale of these drugs with the exception that the parties taking over the contract will be privileged to sell such an amount outside of the United States as will recoup them for the amount of money invested, something over $200,000, if we get in in time to accept that contract. That $200,000 will cover about two million dollars worth of drugs, salvarsan, quinine and a great many other drugs which are either unobtainable or where the price has advanced five hundred per cent.

It is the intention to give them first to hospitals treating wounded soldiers and sailors and others wounded in the war, and also to give them to dispensaries treating people who are unable to purchase these drugs. The drugs will be given away in the order of applications received and a bureau of distribution will be created. Whether or not this will go through I do not know but I thought it might be interesting to the members of the medical profession to know that an attempt has been made to secure the advantages of that provision of the treaty of peace.

THE PRESIDENT: Has the secretary any further communications?

THE SECRETARY: Dr. Gerald B. Webb, Colorado chairman, presented the following preambles and resolutions from the committee to which was referred the matter of publishing the medical and surgical history of the World War.

WHEREAS, The Surgeon-General of the Army has asked for an appropriation from congress of $150,000 to publish a medical and surgical history of the part played by the United States in the World War, and

WHEREAS, This appropriation has been approved by the Chief of Staff and the Secretary of War, and is now in the hands of the proper committee in congress as a part of the Sundry Civil Bill, and

WHEREAS, The American Medical Association of some 83,000 members, of which a large proportion served in the medical services of the United States, is of the firm belief that the expenditure of this comparatively small sum would be much more than repaid in the benefits to the medical profession and to the public, and

WHEREAS, Many very valuable lessons were learned by the medical profession during the war, and it is feared that many of these will be lost unless this history is immediately published, and that failure to do this would have the unfortunate result of depriving the medical profession and the public of scientific, sanitary, surgical and medical information of the greatest value to their well being, and

WHEREAS, The value of a similar history has been well demonstrated in the publication of the medical and surgical history of the Civil War, although its appearance was regrettably delayed;

Resolved, That the American Medical Association earnestly urges that the sum in question be appropriated for the purpose stated and the publication of the volumes be expedited as quickly as possible. and be it further

Resolved, That copies of this resolution be sent to the Speaker of the House, Mr. Good, Chairman of the Committee in Charge of the Sundry Civil Bill, to the Secretary of War, and to the Surgeon-General of the United States Army.

I have been asked by the secretary of the American Medical Association to read this resolution before this House of Delegates. He has not asked for any special action but simply asked it be read.

THE PRESIDENT: Do you wish to take any action upon these resolutions that have been read by the secretary? If you wish to take no further notice of them there is nothing further before the House of Delegates.

DR. P. M. HOLL: I desire to have this resolution read at this time:

WHEREAS, The Minnesota State Medical Association is assembled in annual convention to discuss improved methods of surgery and medicine that its members may be of greater service to their fellow men, and

WHEREAS,. The experience and study of years has shown that awakened public opinion is essential to the success of measures taken to prevent the spread of disease and to remedy existing defects, therefore be it

Resolved, That the voluntary preventive public health work of the eighty-seven county public health associations of this state, conducted in cooperation with the American Red Cross, the Northwestern Pediatric Society, the State Dental Society, the Pediatric Department of the University of Minnesota, the State Advisory Commission on Tuberculosis, the State Board of Health, the State Federation of Women's Clubs, the Minnesota Academy of Ophthalmology, the Obstetrical and Gynecological Society of Minnesota, the State Department of Education, and other interested bodies, centered in the activities of the Minnesota Public Health Association, is worthy of our sincerest endorsement; that we approve the method of financing these preventive measures through the sale of Christmas seals and health bonds, and believe that every one interested in the great modern voluntary public health movement should give their hearty support to this superlatively important work, in education, demonstration and legislation.

I move the adoption of the resolution.

The motion was duly seconded and carried.

There being no further business, a motion to adjourn was made, seconded and carried, and the House of Delegates then adjourned sine die.

MINNESOTA STATE MEDICAL ASOCIATION. SECTION ON SURGERY

The first session of the Section on Surgery of the Minnesota State Medical Association was held in the Masonic Temple, St. Paul, on Thursday, September 30, 1920. The meeting was called to order at 9:20 A. M. by the chairman, Dr. A. E. Wilcox, Minneapolis.

Dr. C. H. Mayo, Rochester, read a paper entitled, "Cholecystectomy with Modified Drainage." It was discussed by Drs. Archibald MacLaren, St. Paul, John T. Rogers, St. Paul, Joseph A. Blake, New York City, W. H. Magie, Duluth, M. M. Ghent, St. Paul, C. M. Roan, Minneapolis, and C. H. Mayo, Rochester.

Dr. Theodore Leete Chapman, Duluth, read a paper entitled, "Factitious Toxicity of Previously Simple Goiters." Discussed by C. H. Mayo, Rochester, and F. L. Chapman, Duluth.

Dr. Harry P. Ritchie, St. Paul, read a paper entitled, "The Repair of Hare Lip and Cleft Palate Deformity." Discussed by Drs. Harry B. Zimmerman, St. Paul, Gordon B. New, Rochester, R. E. Farr, Minneapolis, and H. P. Ritchie, St. Paul.

Dr. R. E. Farr, Minneapolis, read a paper entitled, "Methods of Meeting the So-Called Shortcomings of Local Anesthesia."

Dr. Arthur F. Bratrud, Minneapolis, read a paper entitled, "Present Status of the Local Anesthesia Problem."

Dr. Stanley R. Maxeiner, Minneapolis, read a paper entitled, "The Present Concept of Local Anesthesia Technique." The papers of Drs. Farr, Bratrud, and Maxeiner were discussed jointly by Drs. L. E. Daugherty, St. Paul, Labete, France, George Earl, St. Paul, J. A. Evert, Brainerd, R. E. Farr, Minneapolis, and A. F. Bratrud, Minneapolis.

Dr. A. C. Strachauer, Minneapolis, read a paper entitled, "The Surgical Treatment of Cerebral Hemorrhage of the New-Born." It was discussed by Drs. F. C. Rodda, Minneapolis, Margaret Warwick, Minneapolis, J. C. Litzenberg, Minneapolis, Frederich, Univ., Minneapolis, S. R. Maxeiner, Minneapolis, O. R. Bryant, Minneapolis, and A. C. Strachauer, Minneapolis.

AFTERNOON SESSION

A joint meeting with the Section on Medicine was held Thursday afternoon, September 30th.

SECOND SESSION—FRIDAY, OCTOBER 1, 1920.

The meeting was called to order at 9:15 A. M. by the chairman, Dr. A. E. Wilcox, Minneapolis.

Dr. W. E. Sistrunk, Rochester, read a paper entitled, "Mixed Tumors of the Parotid Gland." It was discussed by Drs. Moses Barron, Minneapolis, A. R. Colvin, St. Paul, H. B. Sweetser, Minneapolis, and W. E. Sistrunk, Rochester.

Dr. E. Starr Judd, Rochester, read a paper entitled, "Cysts of the Pancreas." It was discussed by Drs. Robert Earl, St. Paul, Harry P. Ritchie, St. Paul, A. T. Mann, Minneapolis, R. E. Farr, Minneapolis, Arnold Schwyzer, St. Paul, and E. S. Judd, Rochester.

Dr. William Murray, Minneapolis, read a paper entitled, "Diagnosis and Indications for Operation in

Acute Mastoiditis." It was discussed by H. I. Lillie, Rochester, J. A. Pratt, Minneapolis, F. G. Watson, Rushmore, C. H. Mayo, Rochester, A. R. Colvin, St. Paul, R. G. Allison St. Paul, and W. R. Murray, Minneapolis.

Dr. L. W. Morsman, Hibbing, read a paper entitled, "Uses and Advantages of Electric-Driven Bone Surgery Equipment in Head Surgery, with Particular Reference to Ear, Nose and Throat Operations." It was discussed by J. A. Pratt, Minneapolis, H. I. Lillie, Rochester, and L. W. Morseman, Hibbing.

Dr. John De J. Pemberton, Rochester, read a paper entitled, "Surgery of Substernal and Inthrathoracic Goiter." It was discussed by Drs. Arnold Schwyzer, St. Paul, A. T. Mann, Minneapolis, Theodore L. Chapman, Duluth, E. S. Judd, Rochester, G. E. Benson, Minneapolis, and John De J. Pemberton, Rochester.

Dr. Frank M. Burch, St. Paul read a paper entitled, "Ocular Tuberculosis." It was discussed by Drs. W. W. Lewis, St. Paul, William R. Murray, Minneapolis, P. D. Berrisford, St. Paul, C. N. Spratt, Minneapolis, William Benedict, Rochester, and F. M. Burch, St. Paul.

Drs. F. J. Pratt and J. A. Pratt, Minneapolis, read a paper entitled, "A Report of Fifty Consecutive Cataract Operations by the Smith-Indian-Fisher Method." It was discussed by Drs. F. M. Burch, St. Paul, William Benedict, Rochester, C. N. Spratt, Minneapolis, F. J. Pratt, Minneapolis.

Owing to the lateness of the hour the paper by Dr. Enest Z. Wanous, Minneapolis, entitled, "Problems of the Fallopian Tube Infection Period," was not read.

AFTERNOON SESSION

There was a joint meeting with the Section on Medicine Friday afternoon, October 1, 1920.

MINUTES OF THE SECTION ON MEDICINE MINNESOTA STATE MEDICAL ASSOCIATION.

The first session of the Section on Medicine of the Minnesota State Medical Association was called to order in the Masonic Temple, St. Paul at 9:30 A. M., Thursday, September 30, 1920, by the Chairman, Dr. Charles Lyman Greene, St. Paul.

DR. MAX SEHAM presented a paper on "The Physical Examination of the Normal Heart of the Child." Discussed by Drs. W. R. Ramsey, St. Paul, and E. J. Huenekens, Minneapolis.

DR. F. C. RODDA, Minneapolis, read a paper entitled "Hemorrhagic Disease of the New-Born." Discussed by Drs. Martin D. Ott and J. C. Litzenberg, Minneapolis.

DR. GEORGE DOUGLAS HEAD, Minneapolis, read a paper on "Acute Lymphatic Leukemia." Discussed by Drs. J. P. Schneider, Minneapolis; H. Z. Giffin, Rochester, Minn.; E. L. Tuohy, Duluth; L. A. Nippert, Minneapolis; J. W. Andrews, Mankato; Moses Barron, Minneapolis; and George Douglas Head.

DR. ERNEST T. F. RICHARDS, St. Paul, presented a paper entitled "Polycythemia Vera." Discussed by Drs. H. Z. Giffin, Rochester, Minn.; H. L. Ulrich, Minneapolis; L. G. Rowntree, Rochester; R. M. Wilder, Rochester, Minn.; George Douglas Head, Minneapolis; and E. T. F. Richards.

DR. L. G. BROWNTREE, Rochester, Minn., addressed the Section on the subject of "Diabetes Insipidus and Water Balance in the Body." Discussed by Drs. Russell M. Wilder, Rochester, Minn.; Joseph L. Miller, Chicago; J. W. Andrews, Mankato; and L. G. Rowntree.

DR. A. T. HENRICI, University of Minnesota, read a paper on "The AcidFast Actinomycetes." Discussed by Drs. L. G. Rowntree, Rochester, Minn.; and A. T. Henrici.

DR. W. P. LARSON, Minneapolis, who was to have presented a paper on "The Use and Abuse of Vaccines," was unable to be present and his paper was passed.

Adjournment 12:30 P. M.

SECOND DAY
FRIDAY, OCTOBER FIRST, 1920.

The second session of the Section on Medicine of the Minnesota State Medical Association was called to order in the Masonic Temple, St. Paul, at 9:15 A. M., by the Chairman, Dr. Charles Lyman Greene, St. Paul.

DR. E. L. TUOHY, Duluth, presented a paper by W. E. Mentzer, D. D. S., and himself entitled "An Attempt to Unify and Harmonize Points of View of Medical and Dental Professions Toward the Constitutional Influence of Dental Pathology." (With lantern slide demonstration by Dr. Mentzer. Discussed by Drs. Hartzell, (D. D. S.,) Minneapolis, S. Marx White, Minneapolis; C. R. Ball, St. Paul; Joseph A. Pollia, University of California; E. L. Tuohy and W. F. Mentzer.

DR. C. EUGENE RIGGS, St. Paul, read a paper entitled "Three Neuropsychiatic Notes: Epilepsy, Lethargic Encephalitis and the Dementia Precox Syndrome." Discussed by Drs. C. R. Ball, St. Paul; S. Marx White, Minneapolis; T. L. Birnberg, St. Paul; and C. Eugene Riggs.

DR. WALTER D. SHELDON, Rochester, Minn.; presented a paper on "Traumatic Ulnar Neuritis, a Neurological Study." Discussed by Dr. Angus Morrison, Minneapolis.

SYMPOSIUM: "The Diagnosis and Treatment of Early Pulmonary Tuberculosis."

DR. F. W. WITTICH, Minneapolis, presented "Classification and Symptomatology."

DR. J. W. BELL, Minneapolis, presented "The Physical Signs."

DR. W. R. RAMSY, St. Paul, presented "Symptoms and Diagnosis in Childhood."

DR. F. S. BISSELL, Minneapolis, presented "The Roentgen Diagnosis."

DR. W. J. MARCLAY, Minneapolis, presented "Treatment."

These five papers were discussed by Drs. H. E. Robertson, University of Minnesota; Ernest Mariette, Glen Lake Sanitarium; H. Longstreet Taylor, St. Paul ; F. H. Hacking, Minneapolis; W. R. Ramsey, St. Paul; and W. J. Marclay, Minneapolis.

The Chairman announced the results of the election of officers and thanked the large audience for their attendance and close attention to the program.

Adjournment 12:45 P. M.

MINUTES OF THE FIRST AND SECOND GENERAL SESSIONS

The first General Session of the Minnesota State Medical Association was called to order in the Masonic Temple, St. Paul, on Thursday, September 30th, 1920, by the president, Dr. James H. Adair, Owatonna, at two-twenty P. M.

DR. ADAIR: That an Association of this magnitude should be able to meet for two days in the capitol city of the state without attracting the official attention of the authorities, speaks well for its character (laughter). Whether this be due to the fact that the Association, like some few of the individual members, has grown old and better as years have gone by, or whether this may be ascribed to the influence of the eighteenth amendment is not for me to say. However, I am going to ask His Honor, the Mayor of the city of St. Paul, to tell us what he thinks about it and to look us over and give us his best judgment. Gentlemen, I am very glad to introduce the Hon. L. C. Hodgson (applause).

MAYOR HODGSON: Mr. President, my friends and neighbors: It would be very presumptious on

my part to attempt to do more than to extend to you all a cordial welcome to the city of St. Paul, and I do that with a great deal of personal pleasure because I feel that a gathering of this kind in this city represents not only a gathering from which there is to come much good to the medical profession itself, but that you will in large measure contribute to that steadiness of opinion which is so greatly to be desired in all things.

I have had the pleasure of being very close to some of the physicians and surgeons of this city, and while I would not stand up in any cheap spirit of flattery and say that you are better than other men, there is a sense in which I think I can honestly say that the surgeon and the physician represents a spirit in every community which is entirely apart from their influence on questions of health. First of all, in times like these especially, I believe that a gathering like this does have an influence on public thought which is greatly to be desired. Whatever else you represent, ladies and gentlemen, you represent the spirit of healing, of building up the wounds and tragedies, we may say, of human life and if there is anything we need to emphasize today in the activities of life it is the necessity of doing our part and acting in a spirit and for the purpose of building and healing, of doing away with those influences which are destructive.

For five terrible years there has been apparent in this world no spirit except the spirit of destruction, and during these terrible years there has been no profession which has more nobly and persistently been laboring to create a spirit of construction than your great profession. We have abroad today in the world, as we all know, a spirit which is destructive, a spirit of hatred, which we all hope will be temporary, but I am sure you will all agree with me that in the domain of activities, in the domain of human life itself, it is necessary that we do our work in the building, and especially in building upon those foundations which have been already secured.

There is no surgeon or physician who would consider any case in private practice as if it were the first case of its kind on record. However conscious you may be of our work, you are always conscious of the fact that gentlemen in former generations of your profession have had these same problems to contend with. You are building on instead of trying to start as if there were something new in the history of the world. I think it is equally true that we are never to have anything in the field of government or human society from these people who deal with things as though the problems had never been in the world before. In other words, that we cannot wipe out the discoveries that other men have made through the ages. So I feel that men and women who represent the recognition of all that has been achieved in the past and lay their work on the foundations that have already been laid must contribute to the public sentiment in a community, and I am glad to welcome you to St. Paul because you do represent the healing of the world.

I hope that in your meetings here you will not only get the practical results which are of benefit to you as surgeons and physicians, but also the human element which will give you an enlarged vision of life and of citizenship. I know that is the spirit in which you are gathered. You are not here alone as doctors, but you have a more specific duty as citizens to contribute to the general welfare of citizenship in this community of ours.

And so I extend to you a very cordial welcome and hope you will feel happy in our city. We have not the greatest city in the world—if I said we had I would be reminded by some of my friends of of comradship and hospitality, and I hope you will Minneapolis—but I believe you will find here a spirit have an opportunity to test this spirit of hospitality and find it genuine. I hope you will feel as though you were among friends and neighbors. As Mayor of St. Paul I would rather have you go away feeling that you had been among friends, and neighbors and comrades than as if you had seen many large banks, and libraries and jails and other buildings.

I welcome you and hope that far beyond the joys of physicians and surgeons you will carry away an enlarged view of humanity at this time when we are making the world over to have a better place to live in. I welcome you to St. Paul and wish you every kind of good luck and God speed! (Prolonged applause)).

THE SECRETARY: Before continuing the program, gentlemen, I wish to remind you that the Annual Banquet is to be held this evening at six-thirty in the Palm Room at the St. Paul Hotel. All those desiring tickets please secure them before one o'clock. Following the banquet an entertainment will be supplied by the Ramsey County Society and you are all urged to attend. The Alumni luncheons are to be held tomorrow, Friday, at twelve-fifteen.

I will take this occasion also to request all the members present to be sure to register, and to remind you that all papers read are to be handed in immediately.

DR. JOSEPH. L. MILLER, Chicago, Illinois, presented a paper entitled "Some of the Problems in Internal Medicine."

DR. JOSEPH A. BLAKE, New York City, read a paper on "The Application of War Measures in Treating Fractures to Those in Industrial Occupations," and gave a lantern slide demonstration.

MR. FREDERICK L. HOFFMAN, Third Vice President and Statistician, The Prudential Insurance Company of America, Newark, N. J., addressed the Association on the subject of "Cancer Control," in the place of Dr. Harvey R. Gaylord, Buffalo, who was unable to be present.

The second General Session of the Minnesota State Medical Association was called to order in the Masonic Temple, St. Paul, on Friday, October 1, 1920, by the President, Dr. James H. Adair, Owatonna, at two-twenty P. M.

Dr. Adair requested Dr. E. M. Clay, First Vice President, to take the chair while he delivered the President's Address, entitled "Some Medical Traits and Their Consequences."

The President then resumed the chair.

MR. FREDERICK L. HOFFMAN, The Prudential Insurance Company of America, Newark, N. J., delivered an address on the subject of "Compulsory Health Insurance and the Medical Profession."

MR. GEORGE R. LAIRD, Special Field Representative, addressed the Association on "The Peace Time Program of the American Red Cross."

MR. LAIRD: Mr. President, Gentlemen of the Medical Fraternity of Minnesota: I am permitted through the kindness of your officials to outline to you briefly for a few minutes the peace time program of our national organization. I have, I understand, but a few minutes and I am really glad of it because I would not like to make a long winded speach anyway. I know you have your own particular problems which interest you and it would be unkind of me to take much of your time. If I did you might feel like the married man whose wife was giving him a "curtain lecture." She talked on and on and after about an hour he got tired and said to her, "Mary, do you remember the night I popped the question?" "Yes," said Mary, "I remember it very well; why?" "Do you remember how when I asked you to marry me you kept still for a whole hour?" "Yes, John,

I remember." "Well," said John, "that was the happiest hour of my life." (Laughter).

The program for our work is so large that it is impossible to present anything more than some of the outstanding features, but perhaps that is all that is necessary. The President of the Red Cross, Mr. Livingston Farrand has just returned from abroad, where he has been making a careful study of conditions, and he comes back with the message that it would be impossible—in fact, a calamity, a world calamity, for the American Red Cross to withdraw from the field of activities at the present time. He reports that he has found over there a vast field for our work. We have several hundred nurses over there in Russia and Poland 'carrying on' today. He reports that there are many millions of children over there who are orphans, and no one who has children can help feeling sympathy for the children whose parents were killed during the war, and who are left over there groping hopelessly unless the Americans and other people who have the intelligence and resources can come to their relief. The American Relief Association working under Herbert Hoover are working carefully to supply the food, but the medical care and treatment which so many of them need must be brought to them largely through the instrumentality of the American Red Cross, and so the peace time program as it is going on today embraces that international phase of activity.

The American Red Cross League helped to establish the World League in which thirty nations are interested and which together have charge of the world work. That World League, which met in Switzerland recently, has called upon the American Red Cross to lend its influence and its financial support to the work over there, and that is part of the peace work of the American Red Cross. We had hoped to withdraw almost entirely from the work in Europe, but in view of the vast need of constructive work over there we cannot withdraw at present.

In this country the American Red Cross is carrying on its work of every kind, as well as in other countries where thousands of our Marines are operating today. There are thousands of soldiers still in the hospitals who need nursing service and the American Red Cross is carrying on that work and will continue to carry it on and will have to carry it on.

The civilian relief work is another phase of our peace time program. During the fiscal year just closed the American Red Cross gave relief in seventy-three great disasters, such as the one in Galveston and in various other places where medical and surgical supplies were sent to relieve the situation. Just recently in New York where the bomb throwers worked their terrible deed in Wall Street, the American Red Cross rushed in and by reason of its organization was able to render great assistance. So in seventy-three great disasters in 1920 the American Red Cross has carried on its great relief work.

Now we have another phase of work which I wish to bring especially to this body, and that is the work in connection with public health. We realize that only as we co-operate with the medical officials through their advice and influence in the various communities can we carry on the work. The gentleman who just addressed you, and whose address I so much enjoyed, spoke of the fact that many pseudo-reformers are trying to carry on work in public health that is very badly advised. The American Red Cross has never tried to carry on any public health work without the endorsement of the medical profession itself. Mr. Livingston Farrand, the President, would never tolerate for a moment anything that was not in perfect harmony with the profession. The American Red Cross realized that during the war there were in this country and Europe and many Asiatic countries problems of disease in which they could be of great assistance. The American Red Cross has out today what might be called an army of officials who are carrying on a work of health education. During the year 1919 they gave courses in home hygiene and care of the sick to many thousands of women and girls. That was quite a work of education. In the state of Oklahoma they have so thoroughly recognized the value of these courses of home hygiene that they have established them throughout the state, and courses in home hygiene are being given in normal schools and public schools and state colleges. This problem of public health is rather hard for a layman to discuss before a body of medical men, but the Red Cross bases its work in public health upon this proposition, to which some of you may not agree, but I believe most of you will agree, that there is in this country today a vast lot of preventable diseases. I understand that some physicians have said that 60 per cent is preventable if the proper health education be put in operation. I do not know whether that is too strong a statement, but I think you will agree with me that if the public is educated along these lines, and know something of what to eat and what to drink, and how to take proper care of their eyes and their nose and their throats, and those problems of public health that can be conveyed by a trained nurse, such as are sent by the American Red Cross—and we do not allow our courses to be given except by graduate nurses—I believe that you will agree with me that when these courses are given by such nurses that a vast amount of disease and death can be prevented. I know that many industrial concerns are having courses given to their employes. I talked recently with an official of the Hood Tire Company and he said that as a result of the work being done there they had cut down the average sickness of their employes from nine days a year to five and one-tenth days a year. What is being done there can be done in other industrial concerns and in other communities.

So the American Red Cross is going into this work to the best of its ability. Through its officials it is co-operating with the medical fraternity and is doing this work in those localities where a health official does not exist. Away out in the rural districts it is carrying on this work and as soon as that work is done the American Red Cross will be delighted to turn the work over to the regular practitioners who may be there. We want your help.

I thank you. (Applause)).

PRESIDENT ADAIR: I will now request our Secretary, Dr. Hare, to give us a brief report of the House of Delegates.

DR. HARE: The Secretary wishes to report from the standpoint of registration the largest meeting of the Minnesota State Medical Association within his memory, at present there being 622 registrations. (Applause).

In the House of Delegates there are fifty-three members and we had an attendance of thirty-five, most of the component societies, of which there are thirty-seven at the present time, being represented.

In the Secretary's report he stated that we have 1548 members. We should have a great many more.

The Treasurer's report a year ago showed a balance of $3630.73. His report now shows a balance of $3366.62, a gradual decline in the amount of funds in the treasury.

For legal expenses last year in defense of various members who have been sued for mal-practice we have expended $2148.00. There have been more suits filed in the past year than in the preceeding two years. All of these suits have either been successfully defended, or dismissed in court without being

submitted to the jury, a record of which we may well be proud. (Applause).

The Editing and Publishing Committee reported for a period of almost three years during which Minnesota Medicine has been published, a surplus of $200.00. For the past year there has been a deficit of a little over $700.00. The increased cost of production has been so rapid as to begin to wipe out the surplus which has been accumulated. Consequently, the House of Delegates has stipulated that from October 1st on a credit of $2.00 per capita instead of $1.00 be allowed Minnesota Medicine for publication, and this we believe, even in spite of the high cost of publishing the magazine, will be sufficient to permit the enlargement of the journal and will increase its efficiency. It has been stated by a man who knows medical magazines that Minnesota Medicine is the best looking medical journal in the United States, and that there are only one or two better journals in the United States, and I submit to you, gentlemen, that that is another record of which we may well be proud (applause). A lusty infant less than three years old—and with your hearty co-operation and support we can boast in a short time of the best looking and the best journal in the country.

The recommendations from the Council were three: (1) That a charter to the Redwood-Brown County Society be granted; (2) that Jackson County, which surrendered its charter a year ago, be joined to the Southwestern Society; (3) that the dues be increased to $5.00.

Two Amendments to the Constitution were brought up. First, to strike out the By-Law relating to medical defense, but after a long and enlightening discussion it was decided to leave it, and so the Constitution is not changed in that respect. The second amendment was in relation to the election of the section secretaries and chairmen. Last year it was suggested that the section secretaryship would be for two years, but it has been decided to leave it as before.

The recommendations by the Secretary were that the annual dues be raised from $4.00 to $5.00 per member. That an Executive Secretary be provided who shall devote his or her entire time to the conduct of the business of the State Medical Association in order that the work of the Association may be centralized and taken care of through a single office, thus eliminating the re-duplication of the work which has been so large in the past, and thus increasing the efficiency of the officers. In this way the work of the Secretary's office and of Minnesota Medicine can be concentrated.

The election of officers resulted as follows:

PRESIDENT.

Dr. C. Eugene Riggs - - - - - St. Paul

FIRST VICE-PRESIDENT

Dr. Arthur N. Collins - - - - Duluth

SECOND VICE-PRESIDENT

Dr. Fred P. Strathern - - - - St. Peter

THIRD VICE-PRESIDENT

Dr. W. A. Hunt - - - - - - Northfield

SECRETARY.

Dr. Carl B. Drake - - - - - St. Paul

TREASURER.

Dr. F. L. Beckley - - - - - St. Paul

COUNCILOR—SIXTH DISTRICT.

Dr. F. R. Weiser - - - - - - Windom

DELEGATE AMERICAN MEDICAL ASSOCIATION.

Dr. W. H. Magie, (2 years) - - Duluth

ALTERNATE.

Dr. J. L. Rothrock (2 years) - - St. Paul

The next meeting place will be Duluth (applause), the dates, August 24, 25 and 26, 1921.

We passed a resolution of thanks of the Association of the most cordial character to all of our guests who have contributed so largely to the successful conclusion of our program. The thanks of the Association were also given to St. Paul and the Ramsey County Medical Society for the hospitality and entertainment which they have so graciously given us during the course of the session. (Applause).

PRESIDENT ADAIR: Will the Committee on Notification now kindly present the President-Elect?

DR. F. R. WEISER: Mr. President, Members—it gives me much pleasure to present Dr. C. Eugene Riggs of St. Paul as President-Elect of the Minnesota State Medical Association. (Prolonged applause).

PRESIDENT ADAIR: Gentlemen, I think the State Medical Association has honored itself much more than the gentleman on my right by electing him as its President for the ensuing year (laughter and applause).

We will now be entertained by an illustrated address on "Minnesota Birds and Animals" by Dr. Thomas S. Roberts of Minneapolis.

Adjournment at 5:00 P. M.

District and County Roster and Alphabetical Roster of the Minnesota State Medical Association 1920

OFFICERS AND COMMITTEES

PRESIDENT
J. H. ADAIR, M. D.....Owatonna

FIRST VICE-PRESIDENT
E. M. CLAY, M. D.....Renville

SECOND VICE-PRESIDENT
C. B. LEWIS, M. D.....St. Cloud

THIRD VICE-PRESIDENT
H. C. COONEY, M. D.....Princeton

SECRETARY
EARLE R. HARE, M. D.....Minneapolis

TREASURER
F. L. BECKLEY, M. D.....St. Paul

COUNCILOR—FIRST DISTRICT
C. E. DAMPIER, M. D. (2 years).....Crookston

COUNCILOR—SECOND DISTRICT
J. G. MILLSPAUGH, M. D. (3 years)....Little Falls

COUNCILOR—THIRD DISTRICT
W. A. DENNIS, M. D. (3 years).....St. Paul

COUNCILOR—FOURTH DISTRICT
R. J. HILL, M. D. (2 years).....Minneapolis

COUNCILOR—FIFTH DISTRICT
H. M. WORKMAN, M. D. (3 years).....Tracy

COUNCILOR—SIXTH DISTRICT
F. R. WEISER, M. D. (1 year).....Windom

COUNCILOR—SEVENTH DISTRICT
F. A. DODGE, M. D. (2 years).....Le Sueur

COUNCILOR—EIGHTH DISTRICT
W. F. BRAASCH, M. D. (3 years).....Rochester

MEMBERS OF THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION

Delegates

W. H. MAGIE, M .D. (1 year).....Duluth
J. W. Bell, M. D. (2 years).....Minneapolis

Alternates

J. L. ROTHROCK, M. D. (1 year).....St. Paul
A. E. SPALDING, M. D. (2 years).....Luverne

COMMITTEE ON PUBLIC POLICY AND LEGISLATION
J. C. LITZENBERG, M. D.....Minneapolis
ROBERT EARL, M. D.....St. Paul
W. H. MAGIE, M. D.....Duluth

COMMITTEE ON NECROLOGY
A. E. SPALDING, M. D.....Luverne

MEMBER OF NATIONAL LEGISLATIVE COUNCIL
H. P. RITCHIE, M. D.....St. Paul

COMMITTEE ON SOCIAL INSURANCE
J. W. ANDERWS, M. D.....Mankato
J. S. GILFILLAN, M. D.....St. Paul
F. R. HARDY, M. D.....Faribault

DELEGATION TO ASSIST IN THE COLLECTION AND PUBLICATION OF THE PAPERS OF THE LATE DR. H. A. TOMLINSON
F. P. STRATHERN, M. D.....St. Peter

THE HOSPITAL COMMITTEE
A. W. ABBOTT, M. D.....Minneapolis
W. E. SISTRUNK, M. D.....Rochester
M. H. CREMER, M. D.....Red Wing

SECTION ON MEDICINE
C. L. GREENE, M .D., Chairman.....St. Paul
E. L. GARDNER, M. D., Secretary.....Minneapolis

SECTION ON SURGERY
A. E. Wilcox, M. D., Chairman.....Minneapolis
H. B. ZIMMERMAN, Secretary.....St. Paul

COMMITTEE ON NARCOTICS
J. W. BELL, M. D., Chairman.....Minneapolis
E. T. F. RICHARDS, M. D.....St. Paul
F. A. DODGE, M. D.....Le Sueur

COMMITTEE ON CANCER
H. E. ROBERTSON, M. D., Chairman....Minneapolis
W. C. McCARTY, M. D.....Rochester
E. C. ROBITSCHEK, M. D.....Minneapolis

COMMITTEE TO FORMULATE A PLAN FOR REFERENCE COMMITTEE SYSTEM
G. D. HEAD, Chairman.....Minneapolis
H. L. TAYLOR, M. D.....St. Paul
W. A. COVENTRY, M. D.....Duluth

COMMITTEE ON PUBLIC HEALTH
CHAS. E. SMITH, M. D.....St. Paul
ORIANNA McDANIEL, M. D.....Minneapolis
C. C. PRATT, M. D.....Mankato

EDITING AND PUBLISHING COMMITTEE
R. E. FARR, M. D. (3 years).....Minneapolis
L. B. WILSON, M. D. (1 year).....Rochester
H. LONGSTREET TAYLOR, M. D. (2 years)
.....St. Paul
J. E. HYNES, M. D. (5 years).....Minneapolis
J. T. CHRISTISON, M. D. (4 years).....St. Paul

Minnesota State Medical Association

DISTRICT AND COUNTY ROSTER

FIRST DISTRICT

COUNCILOR, C. E. DAMPIER, M. D. (2 years) ..... Crookston

Clay-Becker County Medical Society

Regular meetings, last Monday of January, April, July and October.
Annual meeting, October

President
Meighan, J. W. ..... Ulen

Secretary
Verne, V. E. ..... Moorhead

Adkins, C. M. ..... Grygla
Archibald, F. M. ..... Mahnoman
Briggs, F. W. ..... Fargo
Campbell, A. A. ..... Ogema
Carmen, J. E. ..... Detroit
Darrow, D. C. ..... Moorhead
Gosslee, G. L. ..... Moorhead
Gunderson, R. M. ..... Lake Park
Hagen, O. J. ..... Moorhead
Haight, G. G. ..... Audubon
Hoit, E. E. ..... Detroit
Humphreys, E. W. ..... Moorhead
Larson, O. O. ..... Detroit
Leach, W. D. ..... Callaway
Lowe, L. M. ..... Glyndon
Meighan, J. W. ..... Ulen
Simison, C. W. ..... Hawley
Thornby, H. J. ..... Moorhead
Verne, V. E. ..... Moorhead
Weeks, L. C. ..... Detroit
Winberg, O. K. ..... Lake Park

Red River Valley Medical Society

Polk, Marshall, Pennington, Red Lake, Normal, Kittson, and Roseau Counties
Regular meetings in March, June, September, and December
Annual meeting, third Thursday in December

President
Bratrud, O. E. ..... Warren

Secretary
Blegen, H. M. ..... Warren

Bertelson, O. L. ..... Crookston
Blegen, H. M. ..... Warren
Borreson, Baldwin ..... Warren
Bratrud, Theodor ..... Warren
Bratrud, O. E. ..... Warren
Biederman, Jacob— Thief River Falls
Dampier, C. E. ..... Crookston
Dahlquist, G. W. ..... Lancaster
Dryden, F. M. ..... Crookston
Dunlop, A. H. ..... Crookston
Froehlich, H. W.— Thief River Falls
Hodgson, H. H. ..... Crookston
Hollands, W. H. ..... Fisher
Holmes, W. B. ..... Ada
Just, A. A. ..... Crookston
Kahala, Arthur ..... Crookston
Kirk, G. P. ..... E. Grand Forks
Kirsch, R. L. ..... Crookston
Kjelland, J. S. ..... Crookston
Melby, O. F. ..... Thief River Falls
Morley, G. A. ..... Crookston
Nelson, H. E. ..... Crookston
Norman, J. F. ..... Crookston
Olson, O. H. ..... Erskine
Paulson, A. J. ..... Thief River Falls
Turnbull, Robert ..... Fosston
Watson, N. M. ..... Red Lake Falls
Wattam, G. S. ..... Warren

West Central Minnesota Medical Society

Pope, Stevens, Traverse, and Big Stone Counties
Regular meetings, second Wednesday of January, April and July
Annual meeting, October

President
Whittemore, J. G. ..... Donnelly

Secretary
Leuty, Amos ..... Morris

Bolsta, Chas. ..... Ortonville
Caine, C. E. ..... Morris
Christenson, C. R. ..... Morris
Eberlin, E. A. ..... Glenwood
Elsey, J. R. ..... Glenwood
Essing, C. F. ..... Wheaton
Fitzgerald, E. T. ..... Morris
Gibbon, L. L. ..... Lowry
Karn, B. R. ..... Ortonville
Leland, J. T. ..... Herman
Leuty, Amos ..... Morris
Linde, Herman ..... Cyrus
O'Donnell, D. M. ..... Ortonville
Olliver, C. I. ..... Graceville
Randall, B. M. ..... Graceville
Ransom, L. M. ..... Hancock
Weir, J. D. ..... Beardsley
Whittemore, J. G. ..... Donnelly

SECOND DISTRICT

COUNCILOR, J. G. MILLSPAUGH, M. D. (3 years) ..... Little Falls

Aitkin County Medical Society

Regular meetings, first Monday in each month
Annual meeting, first Monday in December

President
Graves, Carlton ..... Aitkin

Secretary
Ratcliffe, J. J. ..... Aitkin

Catlin, T. J. ..... Palisade
Graves, Carlton ..... Aitkin
Kelly, B. W. ..... Aitkin
Ratcliffe, J. J. ..... Aitkin

Upper Mississippi County Medical Society

Beltrami, Cass, Crow Wing, Hubbard, Koochighing, Morrison, Todd and Wadena Counties
Regular meetings, first Tuesday, January, April, July, October
Annual meeting first Tuesday in January

President
Evert, J. A.....Brainerd

Secretary
Badeaux, G. J.....Brainerd
Allen, F. A.....Crosby
Allen, F. H.....Staples
Badeaux, Geo. J.....Brainerd
Beach, Geo. Wm....Cacak, Serbia
Beise, R. A.....Brainerd
Bone, Merle.....Kelliher
Christie, G. R.....Long Prairie
Collie, H. G.....Brainerd
Corrigan, J. E.....Spooner
Courtney, Walter.....Brainerd
Craig, C.C. ....International Falls
Davis, L. A.....Wadena
Davis, Loyd.....Wadena
Doupe, R. G.....Upsala
Evert, J. A.....Brainerd
Fankboner, A. F.....Hatley
Garlock, A. V.....Bemidji
Ghostley, Mary C.—
International Falls
Gilmore, R.....Bemidji
Goodheart, C. J.....Akeley
Graves, A. F.....Brainerd
Hall, P. M.....State Sanatorium
Healy, R. F.....Pierz
Higgs, W. W.....Park Rapids
Hohman, E. E.....Pine River
Holst, C. F.....Little Falls
Holst, J. B.....Little Falls
House, Z E.....Cass Lake
Houston, C. A.....Park Rapids
Ide, A. W.....Brainerd
Johnson, E. W.....Bemidji
Johnson, O. V.....Sebeka
Kenyon, P. E.....Wadena
Knickerbocker, F. H.....Staples
Knights, F. A.....Pequot
Knights, S. G.....Randall
Laney, R. L.—
Deer River, Hasca Co.
Laughlin, J. T.....Grey Eagle
McCann, D. F.....Bemidji.
McKinnon, J. J.....Wadena
Marcum, E. H.....Bemidji
Mattick, Walter.....Deerwood
Miller, W. A.....N. Y. Mills
Millspaugh, J. G.....Little Falls
Nicholson, J.....Brainerd
Nordin, C. G.....Brainerd
Osburn, B. F...International Falls
Parrott, B. W.....Long Prairie
Pengelly, E. J.....Ironton
Pierce, Chas. H.....Wadena
Reeves, C. E.....Eagle Bend
Reimstead, C. S.....Brainerd
Roberts, L. M.....Little Falls
Sanborn, C. R.....Bemidji
Shannon, E. A.....Bemidji
Shannon, S. .....Crosby
Smith, B. A.....Crosby
Smith, E. H.....Bemidji
Smith, Wm. H.....Cass Lake
Sweetman, R. H.....Menhaga
Thabes, J. A.....Brainerd
Van Valkenberg, B. A.—
Long Prairie
Walde, Geo. Mc T.....Wadena
Watson, A. M.....Royalton
Watson, John D.....Holdingford
Wilcox, F. L.....Walker
Will, W. W.....Bertha
Williams, R. J.....Pine River
Wiltrout, I. G.....Rushford
Withrow, M.E...International Falls

THIRD DISTRICT

COUNCILOR, W. A. DENNIS, M. D. (3 years).....St. Paul

Ramsey County Medical Society

Regular meetings, last Monday of each month except June, July and August
Annual meeting, last Monday in January

President
McCloud, C. N.....St. Paul

Secretary
Hammes, E. M.....St. Paul
Abbott, J. S.....St. Paul
Abramovich, J. H.....St. Paul
Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Alden, J. F.....St. Paul
Aldes, Harry .....St. Paul
Alexander, F.H.....St. Paul
Allen, Mason.....St. Paul
Ancker, A. B.....St. Paul
Arends, A. L.....St. Paul
Armstrong, J. M.....St. Paul
Arouni, Khalil .....St. Paul
Arzt, C. P.....St. Paul
Bacon, Knox.....St. Paul
Bacon, L. C.....St. Paul
Balcome, F. E.....St. Paul
Ball, C. R.....St. Paul
Barsness, Nellie.....St. Paul
Beadie, W. D.....Cannon Falls
Beals, Hugh .....St. Paul
Beckley, F. L.....St. Paul
Benepe, L. M.....St. Paul
Bennion, P. H.....St. Paul
Bentley, Norman P.....St. Paul
Berrisford, Paul D.....St. Paul
Bettingen, J. W.....St. Paul
Binger, H. E.....St. Paul
Birnberg, T. L.....St. Paul
Bock, R. A.....St. Paul
Boeckmann, Eduard.....St. Paul
Boeckmann, Egil.....St. Paul
Bohland, E. H.....St. Paul
Bole, R. S.....St. Paul
Boleyn, E. S.....Stillwater
Bolstad, H. C.....St. Paul
Bray, E. R.....St. Paul
Brimhall, J. B.....St. Paul
Brodie, Walter D.....St. Paul
Brooks, D. F.....St. Paul
Brown, Edward I.....St. Paul
Brown, John C.....St. Paul
Brown, Silas E.....St. Paul
Buckley, E. W.....St. Paul
Burns, F. W.....St. Paul
Burns, R. M.....St. Paul
Burch, F. E.....St. Paul
Cameron, J. A.....St. Paul
Campbell, E. Paul.....St. Paul
Campbell, J. E.....So. St. Paul
Cannon, C. M.....St. Paul
Cannon, Harry.....St. Paul
Carman, C. L.....St. Paul
Carman, Paul I.....St. Paul
Carroll, Wm. C.....St. Paul
Cavanaugh, J. O.....St. Paul
Chamberlin, J. W.....St. Paul
Chatterton, C. C.....St Paul
Christiansen, A.....St. Paul
Christison, J. T.....St. Paul
Clark, T. C.—
Soldiers Home, Minneapolis
Cobb, S. G.....St. Paul
Cole, Wallace .....St. Paul
Colvin, A. R.....St. Paul
Comstock, A. E.....St. Paul
Conheim, Eva.....St. Paul
Cook, Paul B.....St. Paul
Cowern, E. W.....St. Paul
Darling, J. B.....St. Paul
Daugherty, E. B.....St. Paul
Daugherty, L. E.....St. Paul
Davis, Herbert .....St. Paul
Davis, William .....St. Paul
Dedolph, Karl,.....St. Paul
Dennis, W. A.....St. Paul
Dickson, Thos. H. Jr.....St. Paul
Dittman, Geo. C.....St. Paul
Dohm, A. J.....St. Paul
Drake, C. B.....St. Paul
Earl, George A.....St. Paul
Earl, Robert, O.....St. Paul
Ely, O. S.....So. St. Paul
Engberg, E. J.....St. Paul
Ernest, G. C.....St. Paul
Eshelby, E. C.....St. Paul
Ferguson, J. C.....St. Paul
Fogarty, Chas. W.....St. Paul
Freeman, C. D.....St. Paul
Fulton, J. F.....St. Paul
Furber, W. W.....Cottage Grove
Gager, E. C.....St. Paul
Geist, George A.....St. Paul
Ghent, M. M.....St. Paul
Gilfillan, J. S.....St. Paul
Gillette, A. J.....St. Paul
Ginsberg, Wm.....So. St. Paul
Goltz, E. V.....St. Paul
Gotham, C. L.....St. Paul
Greene, C. L.....St. Paul
Gumper, J. B.....Becker
Hagaman, Geo. K.....St. Paul
Hall, A. R.....St. Paul
Hammes, E. M.....St. Paul
Hammond, J. F.....St.Paul
Hawkins, V. J.....St. Paul
Heath, A. C.....St. Paul
Henderson, Andrew—
Powel River, B. C.
Hengstler, W. H.....St. Paul
Hensel, C. N.....St. Paul
Heseltine, V. G.....Taylors Falls
Hesselgrave, S. S.....St. Paul
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
Hilger, L. A.....St. Paul
Hoff, Alfred .....St. Paul
Hoff, Peder A.....St. Paul
Holcomb, J. T.....St. Paul
Holcomb, O.W.....St. Paul
Holl, P. M.....Minneapolis
Hubert, R. I.....Bellflower, Cal.
Hullsiek, H. E.....St. Paul
Hunt, H. E.....St. Paul
Jesion, J. W.....St. Paul
Johnson, Asa M.....St. Paul
Johnson, Hartland, C.....St Paul
Johnson, T. H.....St. Paul
Jones, E. M.....St. Paul
Kannary, E. L.....St. Paul
Kelly, John V.....St. Paul
Kelly, Paul H.....St. Paul
Kern, M. J.....St. Cloud
Kesting, H.....St. Paul
Klein, H. N.....St. Paul
Knauff, M. K.....St. Paul
Kvitrud, G. .....St. Paul
Lande, W. B.....St. Paul
Langenderfer, F. V.....St. Paul
Larsen, C. L.....St. Paul
Leahy, Bartholomew.....St. Paul
Leitch, Archibald.....St. Paul
Lepak, John A.....St. Paul
Lerche, William .....St. Paul
Lewis, J. B.....So. St. Paul
Lewis, W. W.....St. Paul

Little, W. J.....St. Paul
Lufkin, H. M.....St. Paul
McCarthy, W. R.....St. Paul
McClanahan, J. H.....White Bear
McCloud, C. N.....St. Paul
McDavitt, Thos.....St. Paul
McHugh, R. F.....Aitkin
McLaren, Jennette M.....St. Paul
McNevin, C. F.....St. Paul
Mac Laren, Archibald.....St. Paul
Maloney, T. J.....St. Paul
Meyerding, E. A.....St. Paul
Mogilner, S. N.....St. Paul
Molander, H. A.....St. Paul
Molzahn, H. E.....St. Paul
Morrissey, F. B.....St. Paul
Mortensen, N. G.....St. Paul
Moynihan, T. J.....St. Paul
Murphy, E. F.....St. Paul
Myers, Thos. .....St. Paul
Neher, F. H.....St. Paul
Nelson, L. A.....St. Paul
Nippert, H. T.....St. Paul
Nye, Katherine A.....St. Paul
O'Brien, H. J.....St. Paul
Oerting, Harry.....St. Paul
Ogden, B. H.....St. Paul
Ohage, Justus .....St. Paul
Ohage, Justus Jr.....St. Paul
Olson, Chas. A.....St. Paul
Ostergren, E. W.....St. Paul

Peck, L. D.....Hastings
Perry, C. G.....St. Paul
Pine, Auten, A.....St. Paul
Plondke, F. J.....St. Paul
Pool, Daniel .....St. Paul
Quinn, Jas. A.....St. Paul
Ramsey, W. R.....St. Paul
Richards, E. T. F.....St. Paul
Riggs, C. E.....St. Paul
Ritchie, H. P.....St. Paul
Rogers, John T.....St.Paul
Rothrock, J. L.....St. Paul
Rothschild, H. J.....St. Paul
Roy, Philemon.....St. Paul
Rutherford, W. C.....St. Paul
Ryan, John J.....St. Paul
Savage, F. J.....St. Paul
Schatz, F. J.....Rosemount
Schoch, R. B. J.....St. Paul
Schons, Edward.....St. Paul
Schuldt, F. C.....St. Paul
Schulze, Albert G.....St. Paul
Schwyzer, Arnold.....St. Paul
Senkler, G. E.....St. Paul
Shapere, A. D.....St. Paul
Shellman, John L.....St. Paul
Sherper, M. .....St. Paul
Shimonek, John L.....St. Paul
Simon, B. F.....St. Paul
Simon, Geo.. H.....St. Paul

Skinner, H. O.....St. Paul
Smith, Charles E. Jr.....St. Paul
Sneve, Haldor .....St. Paul
Sohlberg, Olaf .....St. Paul
Staley, J. C.....St. Paul
Steen, A. H.....Cottage Grove
Sterner, E. G.....St. Paul
Stevens, F. A.....Lake Elmo
Stierle, Adolph Jr.....St. Paul
Stinnette, S. E.....St. Paul
Stolpestad, H. L.....St. Paul
Sutton, L. F.....St. Paul
Sweeney, Arthur.....St. Paul
Taylor, H. L.....St. Paul
Teisberg, C. B.....St. Paul
Van Slyke, Chas. A.....St. Paul
Vercellini, G.....St. Paul
Von der Weyer, Wm.....St. Paul
Warner, E. F.....St. Paul
Welch, M. C.....St. Paul
Whitacre, J. C.....St. Paul
Whitcomb, Ed. H.....St. Paul
White, J. S.....St. Paul
Whitmore, F. W.....St. Paul
Whitney, A. W.....St. Paul
Williams, Clayton.....St. Paul
Winnick, J. B.....St. Paul
Wold, K. C.....St. Paul
Wood, Harry G.....St. Paul
Zimmerman, H. B.....St. Paul

Washington County Medical Society

Regular meetings, held bi-monthly on second Tuesday of odd numbered months
Annual meeting, November

President
Newman, G. A.....Stillwater
Secretary
Landeen, F. G.....Stillwater
Burfiend, G. H.....Afton
Clark, G. E.....Stillwater

Freligh, E. O'B.....Stillwater
Haines, J. H.....Stillwater
Humphrey, W. R.....Stillwater
Kalinoff, D.....Stillwater
Landeen, F. G.....Stillwater
Merrill, B. J.....Stillwater

Mingo, F. E.....Hugo
Newman, G. A.....Stillwater
Poirier, J. A.....Forest Lake
Thompson, V. C.—
Marine-on-St. Croix
Wells, E. E.....Stillwater

Chisago-Pine County Medical Society

Regular meetings, second Tuesdays of January and July
Annual meeting, second Tuesday of January

President
Murdock, H. G.....Taylors Falls
Secretary
Anderson, C. A.....Rush City
Anderson, C. A.....Rush City
Bohling, B. S.....Sandstone

Conner, W. H.....Finlayson
Dredge, H. P.....Sandstone
Gray, C. E.....Rush City
Gunz, A. N.....Center City
Magnusson, Herman V.—
North Branch

Murdock, H. G.....Taylors Falls
Stowe, A. J.....Rush City
Tilton, A. J.....Alden
Werner, O. S.....Lindstrom
Wiseman, R. L.....Pine City
Zeien, Thos.....North Branch

Central Minnesota District Medical Society

Regular meetings, January, April, July and October
Annual meeting, July

President
Cooney, H. C.....Princeton
Secretary
Parsons, Geo. E.....Elk River

Bacon, H. P.....Milaca
Clifton, Theo. A.....Isanti
Cooney, H. C.....Princeton
Frasier, Geo. W.....Hill City
Parsons, Geo. E.....Elk River

Rheim, J. E.....Mora
Shulean, Nellie .....Cambridge
Stocking, Fred F.....Milaca
Swenson, Chas. .....Braham
Vrooman, F. E.....St. Francis

St. Louis County Medical Society

Regular meetings, second Tuesday of each month
Annual meeting, October 14th, 1920

President
Rowe, O. W.....Duluth
Secretary
Shapiro, E. Z.....Duluth
Abbott, Wm. P.....Duluth
Adams, B. S.....Hibbing
Allaben, G. R.....Buhl
Arminen, K. V.....Duluth
Ayres, G. L.....Ely
Bagley, W. R.....Duluth
Barney, L. A.....Duluth
Berquist, K. E.....Duluth
Binet, H. E.....Grand Rapids
Blacklock, S. S.....Hibbing
Boyer, S. H.....Duluth
Braden, A. J.....Duluth
Bray, C. W.....Biwabik
Bullen, F. W.....Hibbing

Burns, H. J.....Duluth
Carstens, C. F.....Hibbing
Chapman, T. L.....Duluth
Cheney, E. L.....Duluth
Clark, F. F.....Duluth
Collins, A. N.....Duluth
Collins, H. C.....Duluth
Cosgrove, J. H.....Duluth
Coventry, Wm. A.....Duluth
Crowe, J. H.....Virginia
Doolittle, E. F.....Duluth
Drenning, F. C.....Duluth
Eklund, J. J.....Duluth
Eklund, Wm. J.....Duluth
Elias, F. J.—
Morgan Park Hospital, Duluth
Fahey, E. W.....Duluth
Farmer, J. C.....McKinley
Forbes, R. S.....Duluth

Gendron, J. F. X.....Grand Rapids
Gillespie, N. H.....Duluth
Graham, David.....Duluth
Graham, Robert.....Duluth
Grawn, F. A.....Duluth
Greeley, L. O.....Duluth
Haney, C. L.....Duluth
Heimark, O. E.....Duluth
Hirschboeck, F. J.....Duluth
Hirschfield, M. S.....Duluth
Horde, H. .....Duluth
Hulsman, L. J.....Marble
Hursch, M. M.....Grand Rapids
Jenson, L. J.....Duluth
Judson, W. E.....Duluth
Keisling, I. H.....Chisholm
Keyes, C. R.....Duluth
Klein, Harry .....Duluth
Kraft, Peter .....Duluth

Kuth, J. R.....Duluth
Laird, A. L. .....Nopeming
Lenont, C. B.....Virginia
Lindgren, E. I.....Duluth
Linneman, N. L.....Duluth
Lum, C. E.....Duluth
Lyman, Frank—
Riverside Hospital, Duluth
McComb, C. F.....Duluth
McCoy, Mary .....Duluth
McCuen, J. A.....Duluth
McDonald, A. L.....Duluth
McGiffert, E. N.....Duluth
McIntire, E. H.....Virginia
Magney, F. H.....Duluth
Malmgren, C. V.....Virginia
Manley, J. R..... .....Duluth
Martin, L. K.....Duluth
Merriman, L. L.....Duluth
Morsman, L. N.....Hibbing
Murray, D. D.....Duluth
Nicholson, M. A.....Duluth
Paradine, D. J.....Duluth
Pare, L. T.....Duluth
Payette, C. H.....Duluth
Pennie, D. F.....Duluth
Raadquist, C. S.....Hibbing
Reynolds, H. W.....Hibbing
Robinson, J. M.....Duluth
Rowe, O. W.....Duluth
Ryan, J. W...Morgan Park, Duluth
Schroeder, C. H.....Duluth
Schwartz, A. H.....Duluth
Seashore, D. E.....Duluth
Shapiro, E. Z.....Duluth
Smith, C. C.....Carson Lake
Spicer, F. W.....Duluth
St. Clair, G. G.....Duluth
Strathern, M. L.....Gilbert
Sukeforth, L. A.....Duluth
Sutherland, H. M.....Ely
Taylor, C. W.....Duluth
Tibbet, M. H.....Duluth
Tilderquist, D. L.....Duluth
Tuohy, E. L.....Duluth
Turnbull, F. M.....Duluth
Walker, A. E.....Duluth
Wilkinson, S.....Duluth
Winter, J. A.....Duluth

Carlton County Medical Society

President
Walters, F. R.....Moose Lake
Secretary
Raiter, F. U. S.....Cloquet

Brunet, L. M.....Cloquet
Felming, James .....Cloquet
Raiter, F. U. S.....Cloquet
Spurbeck, R. G.....Cloquet
Stewart, A. B.....Cloquet
Walters, F. R.....Moose Lake

FOURTH DISTRICT

COUNCILOR, R. J. HILL, (2 years).....Minneapolis

Hennepin County Medical Society

Regular meetings, first Monday of the month
Annual meeting, first Monday in January

President
Corbett, J. Frank.....Minneapolis
Secretary
Pettit, C. W.....Minneapolis

Abbott, A. W.....Minneapolis
Adair, F. L.....Minneapolis
Allen, H. W.....Minneapolis
Andersen, Arnt G.....Minneapolis
Anderson, A. E.....Minneapolis
Anderson, J. D.....Minneapolis
Arey, H. C.....Excelsior
Aurand, W. H.....Minneapolis
Avery, J. F.....Minneapolis
Baier, Florence C.....Minneapolis
Baker, H. A.....Minneapolis
Baldwin, L. B.....Minneapolis
Barron, Moses .....Minneapolis
Barton, Edgar R.....Minneapolis
Baxter, S. H.....Minneapolis
Bell, John W.....Minneapolis
Bell, J. Warren Jr.....Minneapolis
Benedict, E. E.....Minneapolis
Benjamin, A. E.....Minneapolis
Benn, F. G.....Minneapolis
Benson, Geo. E.....Minneapolis
Bessessen, A. W.....Minneapolis
Bishop, Chas. W.....Minneapolis
Bissell, F. S.....Minneapolis
Booth, A. E.....Minneapolis
Boreen, Clifton A.....Minneapolis
Boutelle, Louisa E.....Minneapolis
Bouman, H. A. H.....Minneapolis
Bracken, H. M.....Minneapolis
Bratrud, Arthur F.....Minneapolis
Brooks, Chas. Noyes...Minneapolis
Brown, E. D.....Minneapolis
Brown, Edward J.....Minneapolis
Brown, Paul F.....Minneapolis
Brown, R. S.....Minneapolis
Byrnes, W. J.....Minneapolis
Cabot, V. S.....Minneapolis
Camp, W. E.....Minneapolis
Campbell, Lowell M....Minneapolis
Campbell, Robt. A.....Minneapolis
Carlaw, C. M.....Minneapolis
Chapman, O. S.....Minneapolis
Cheleen, S. J.....Minneapolis
Chowning, Wm.....Minneapolis
Cirkler, A. A.....Minneapolis
Clark, Howard S.....Minneapolis
Cochrane, Wm. J.....Minneapolis
Condit, W. H.....Minneapolis
Corbett, J. Frank.....Minneapolis
Cosman, E. O.....Minneapolis
Craft, Leo M.....Minneapolis
Crume, Geo. P.....Minneapolis
Cutts, Geo.....Minneapolis
Deziel, G.....Minneapolis
Diesen, C. F.....Minneapolis
Donaldson, C. A.....Minneapolis
Doxey, G. L.....Minneapolis
Drake, C. R.....Minneapolis
Driesbach, N.....Minneapolis
Dunsmoor, F. A.....Minneapolis
Dutton, C. E.....Minneapolis
Egan, John M.....Minneapolis
Eggan, O. K.....Minneapolis
Eitel, G. G.....Minneapolis
Erb, F. A.....Minneapolis
Erdman, C. A.....Minneapolis
Ericson, J. G.....Minneapolis
Fansler, W. A.....Minneapolis
Farr, R. E.....Minneapolis
Feidt, W. W.....Minneapolis
Fjelstad, C. Alford.....Minneapolis
Fleming, A. S.....Minneapolis
Franzen, H. G.....Minneapolis
Gardner, E. L.....Minneapolis
Giessler, Paul W.....Minneapolis
Gordon, G. J.....Minneapolis
Greene, E. K.....Minneapolis
Guilford, H. M.....Minneapolis
Hacking, Frank H.....Minneapolis
Haggard, G. D.....Minneapolis
Hall, J. M.....Minneapolis
Hallowell, W. H.....Minneapolis
Hamel, C. E.....Minneapolis
Hamilton, A. G.....Minneapolis
Hanson, Erling .....Minneapolis
Hanson, Olga S.....Minneapolis
Hare, Earle R.....Minneapolis
Harrington, C. D.....Minneapolis
Hartzell, Thos. B.....Minneapolis
Haverfield, Addie R.....Minneapolis
Haynes, F. E.....Minneapolis
Head, Geo. D.....Minneapolis
Hedbach, A. E.....Minneapolis
Helk, H. H.....Minneapolis
Hendrickson, J. F.....Minneapolis
Higgins, J. H.....Minneapolis
Hill, Eleanor J.....Minneapolis
Hill, R. J.....Minneapolis
Hobbs, C. A.....Minneapolis
Howe, A. W.....Minneapolis
Huenekens, E. J. .....Minneapolis
Hynes, James.....Minneapolis
Hynes, John E. .....Minneapolis
Hvoslef, Jakob.....Minneapolis
Ikeda, Kano .....Minneapolis
Irvine, H. G.....Minneapolis
Jarvis, Bruse W.....Minneapolis
Jensen, M. J.....Minneapolis
Johnson, A. E.....Minneapolis
Johnson, James A.....Minneapolis
Johnson, Julius .....Minneapolis
Johnson, Nimrod .....Minneapolis
Johnson, R. A.....Minneapolis
Jones, G. M.....Minneapolis
Jones, H. W.....Minneapolis
Jones, R. N.....Minneapolis
Jones, W. A.....Minneapolis
Josewich, Alexander....Minneapolis
Kennedy, C. C.....Minneapolis
Kennedy, R. R.....Minneapolis
Kerrick, Stanley.....Minneapolis
Kimball, H. H.....Minneapolis
King, W. R.....Minneapolis
Kirmse, Geo. W.....Minneapolis
Kistler, C. M.....Minneapolis
Knight, H. L.....Minneapolis
Knight, R. T.....Minneapolis
Knight, Ray R.....Minneapolis
Koch, John Chas.....Minneapolis
Kohler, Geo. A.....Minneapolis
Koller, Herman M.....Minneapolis
Koller, L. R.....Minneapolis
Kremer, Walter J.....Minneapolis
Kriedt, Daniel.....Minneapolis
Lajoie, John M.....Minneapolis
LaPierre, C. A.....Minneapolis
Laurent, A. A.....Minneapolis
LaVake, R. T.....Minneapolis
Law, A. A.....Minneapolis
Leavitt, H. H.....Minneapolis
Lee, T. G.....Minneapolis
Leland, M. W.....Minneapolis
Lemstrom, Jarl .....Minneapolis
Lewis, J. D.....Minneapolis
Lind, C. J.....Minneapolis
Linner, H. P.....Minneapolis
Little, J. W.....Minneapolis
Litzenberg, J. C.....Minneapolis
Loomis, E. A.....Minneapolis
Lyng, John .....Minneapolis
Lyon, J. D.....Minneapolis
Lysne, Henry .....Minneapolis
McDonald, H. N.....Minneapolis
McEachran, A.....Minneapolis
McIntyre, George .....Minneapolis
MacDonald, D. A.....Minneapolis
Mac Donald Irving C...Minneapolis
Macnie, J. S.....Minneapolis
Maland, C. O.....Minneapolis
Mann, Arthur T.....Minneapolis
Marriette, Ernest—Glen Lake
Sanatarium, Hopkins, Minn.
Mark, D. B.....Minneapolis
May, W. H.....Minneapolis
Mead, Marion .....Minneapolis
Meyer, E. L.....Minneapolis

Moir, Wm. W.....Minneapolis
Monahan, J. A.....Minneapolis
Monahan, R. H.....Minneapolis
Moorhead, M. B.....Minneapolis
Moren, E.....Minneapolis
Morriss, Herbert A.....Minneapolis
Morrison, A. N.....Minneapolis
Murphy, I. J.....Minneapolis
Murray, W. R.....Minneapolis
Nelson, C. P.....Minneapolis
Nelson, H. S.....Minneapolis
Newhart, Horace .....Minneapolis
Nippert, L. A.....Minneapolis
Nissen, Henrick.....Minneapolis
Noonan, Dan F.....Minneapolis
Nordland, Martin .....Minneapolis
Nordley, H. R.....Minneapolis
Noth, H. W.....Minneapolis
O'Donnell, Jas. E.....Minneapolis
Oberg, C. M.....Minneapolis
Olson, F. A.....Minneapolis
Olson, G. M.....Minneapolis
Olson, Olaf A.....Minneapolis
Oppegaard, M. O.....Minneapolis
Owre, Oscar .....Minneapolis
Parker, E. H.....Minneapolis
Parks, Albert H.....Minneapolis
Patterson, W. E.....Minneapolis
Paulsen, E. L.....Minneapolis
Pederson, R. M.....Minneapolis
Peppard, T. A.....Minneapolis
Perry, Ralph St. J.....Minneapolis
Peterson, J. R.....Minneapolis
Peterson, Thorvald ....Minneapolis
Pettit, C. W.....Minneapolis
Pineo, W. B.....Minneapolis
Poehler, F. T.....Minneapolis
Poppe, F. H.....Minneapolis
Pratt, Fred J.....Minneapolis
Pratt, J. A.....Minneapolis
Preine, Irving A.....Minneapolis
Quimby, Thos. F.....Minneapolis
Quist, H. W.....Minneapolis
Reed, Chas. A.....Minneapolis
Rees, Soren P.....Minneapolis
Reynolds, J. S.....Minneapolis
Ringnell, C. J.....Minneapolis
Rishmiller, J. H.....Minneapolis
Rizer, R. I.....Minneapolis
Roan, Carl M.....Minneapolis
Robert, Thos. S.....Minneapolis
Roberts, W. B.....Minneapolis
Robertson, H. E.....Minneapolis
Robitschek, E. C.....Minneapolis
Rochford, W. E.....Minneapolis
Rodda, F. C.....Minneapolis
Rodgers, C. L.....Minneapolis
Rosen, S.....Minneapolis
Rowntree, L. G.....Minneapolis
Schefcik, J. F.....Minneapolis
Scheldrup, N. H.....Minneapolis
Schmitt, S. C.....Minneapolis
Schneider, J. P.....Minneapolis
Schultz, F. W.....Minneapolis
Schwyzer, G.....Minneapolis
Seashore, Gilbert.....Minneapolis
Sedgewick, J. P.....Minneapolis
Seham, Max .....Minneapolis
Simons, Jalmar.....Minneapolis
Simpson, J. D.....Minneapolis
Sivertson, Ivar .....Minneapolis
Slocumb, Maude .....Minneapolis
Smith, Homer R.....Minneapolis
Smith, Norman M.....Minneapolis
Soderlind, A.....Minneapolis
Soper, John.....Minneapolis
Spratt, C. N.....Minneapolis
Staples, H. L.....Minneapolis
Stomel, Joseph .....Minneapolis
Strachauer, A. C.....Minneapolis
Strout, E. S.....Minneapolis
Strout, G. E.....Minneapolis
Stuhr, Henry C.....Minneapolis
Sweetser, H. B.....Minneapolis
Sweitzer, S. E.....Minneapolis
Taft, J. O.....Minneapolis
Taft, Walter L.....Minneapolis
Tanner, A. C.....Minneapolis
Taylor, Rood.....Minneapolis
Tennyson, Theo. .....Minneapolis
Thomas, D. O.....Minneapolis
Thomas, Geo. E.....Minneapolis
Thomas, Geo. H.....Minneapoolis
Thomas, G. T.....Minneapolis
Thompson, H. H.....Minneapolis
Tingdale, A. C.....Minneapolis
Tyrrell, C. C.....Minneapolis
Ulrich, Henry L.....Minneapolis
Ulrich, Mable S.....Minneapolis
Undine, A. Clyde.....Minneapolis
Voyer, Oswald.....Minneapolis
Van Deboget, L.....Minneapolis
Wanous, E. Z.....Minneapolis
Ward, A. W.....Minneapolis
Warham, T. T.....Minneapolis
Warwick, Margaret ....Minneapolis
Watson, C. W.....Minneapolis
Watson, J. A.....Minneapolis
Wells, H. J.....Minneapolis
Weston, C. G.....Minneapolis
Weum, Thurston W....Minneapolis
White, S. Marx.....Minneapolis
Wilcox, Archa E.....Minneapolis
Williams, Robt. .....Minneapolis
Williams, U. G.....Minneapolis
Willson, Hugh S.....Minneapolis
Wood, Douglas F.....Minneapolis
Woodard, F. R.....Minneapolis
Woodward, F. O.....Minneapolis
Woodworth, Elizabeth..Minneapolis
Wright, C. D.....Minneapolis
Wright, Franklin R.....Minneapolis
Yoerg, O. W.....Minneapolis
Zaworski, E. A.....Minneapolis
Ziskin, Thos. .....Minneapolis

Wright County Medical Society

Regular meetings, quarterly
Annual meeting, first Monday in October

President
Roseau, Victor.....Maple Lake

Secretary
Thoreson, Thor. .....Buffalo
Catlin, John J.....Buffalo

Freed, O. J. R.....Cokato
Harriman, Leonard...Howard Lake
Hawkins, E. P.....Montrose
Holm, H. H.....Cokato
Metcalf, Jas. V.....Monticello

Moffatt, A. G.....Howard Lake
Phillips, A. E.....Delano
Ridgway, A. M.....Annandale
Roseau, Victor.....Maple Lake
Shraeder, E. E.....Watertown
Thoreson, Thor. .....Buffalo

Stearns-Benton County Medical Society

Regular meetings, third Thursday in month
Annual meeting, April

President
Rice, Geo. D.....St. Cloud

Secretary
Beebe, W. L.....St. Cloud
Ausman, C. F.....Paynesville
Beaty, J. H.....St Cloud
Beebe, W. L.....St. Cloud
Brigham, C. F.....St. Cloud
Boehm, J. C.....St. Cloud
Clark, H. B.....St. Cloud
DuBois, J. A.....Sauk Center
DuBois, J. F.....Sauk Center

Dunn, J. B.....St. Cloud
Freeman, W. L.....Foley
Fresleben, Wm.....Sauk Rapids
Gelz, J. J.....Richmond
Glyer, R. T.....Brooten
Goehrs, H. W.....Melrose
Hemstead, Werner .....St. Cloud
Hilbert, P. A.....Melrose
Holdridge, Geo. A.....Foley
Kuhlman, Aug. .....Melrose
Lamb, H. L.....Sauk Center
Lewis, C. B.....St. Cloud
Lewis, E. J.....Sauk Center
Libert, John .....St. Cloud

McDowell, I. F.....St. Cloud
McKibbon, H. E.....St. Cloud
Moynihan, A. F.....Sauk Center
Pilon, P. C.....Paynesville
Putney, G. E.....Paynesville
Rathbun, A. M.....Rice
Rice, Geo. D.....St. Cloud
Ridgeway, Alex.....Belgrade
Sherwood, Geo. E.....Kimball
Staugh, Phil.....St. Cloud
Sutton, C. S.....St. Cloud
Townsend, DeWayne.....Belgrade
Watson, Tolbert.....Albany
Whiting, A. D.....St. Cloud

Kandiyohi-Swift County Medical Society

Regular meetings, third Thursday in December, March, June and September
Annual meeting, third Thursday in December

President
Branton, B. J.....Willmar

Secretary
Jacobs, John C.....Willmar
Benson, I. S.....Willmar
Branton, B. J.....Willmar

Daignault, Oscar .....Benson
Danson, P. C.....Willmar
Frost, E. H.....Willmar
Jacobs, John C.....Willmar
Johnson, Christian .....Willmar
Johnson, Hans .....Kerkhoven

Johnston, Edmund B.....Benson
Kaufman, Wm. C.....Appleton
Kolset, Carl D.....Benson
Rains, J. M.....Willmar
Scofield, C. L.....Benson
Shelver, H. J.....Ortonville

FIFTH DISTRICT

COUNCILOR, H. M. WORKMAN, M. D. (3 years) ..... Tracy

Camp Release District Medical Society

Yellow Medicine, Renville, Lac Qui Parle, Chippewa, and Sibley
Regular meetings, fourth Thursday, January, April, July, October
Annual meeting, fourth Thursday, October

President
Adams, R. C. ..... Bird Island

Secretary
Peterson, H. E. ..... Granite Falls

Adams, R. C. ..... Bird Island
Ardnich, F. H. ..... Belview
Bacon, R. S. ..... Montevideo
Bergh, L. N. ..... Montevideo
Burns, M. A. ..... Milan
Bushey, W. E. ..... Arlington
Clay, E. M. ..... Renville
Cole, H. B. ..... Redwood Falls
Crandall, A. M. ..... Madison
Duclos, J. A. ..... Henderson
Eisengraeber, G. A. .... Granite Falls
Ferguson, J. B. ..... St. Paul
Flower, W. Z. ..... Minneapolis
Gaines, E. C. ..... Buffalo Lake
Gammell, H. W. ..... Madison
Guyer, L. G. ..... Waseca
Hauge, M. M. ..... Clarkfield
Holmberg, L. J. ..... Canby
Johnson, C. M. ..... Dawson
Johnson, H. M. ..... Dawson
Jones, D. N. ..... Minneapolis
Kanne, C. W. ..... Arlington
Kilbride, J. S. ..... Canby
Lee, Walter N. ..... Madison
Lima, Ludwig ..... Montevideo
Lund, S. O. ..... Montevideo
Maercklein, S. R. ..... Renville
Mesker, G. H. ..... Olivia
Nelson, N. A. ..... Dawson
Passer, A. A. ..... Olivia
Penham, F. W. ..... Morton
Peterson, H. E. ..... Granite Falls
Puffer, F. L. ..... Bird Island
Sanderson, A. G. ..... Granite Falls
Smith, L. G. ..... Montevideo
Stensrud, A. A. ..... Dawson
Walker, G. H. ..... Fairfax
Westby, N. ..... Madison
Zimbeck, R. D. ..... Maynard

Brown-Redwood County Medical Society

Regular meeting, June
Annual meeting, June

President
Walker, C. C. ..... Lamberton

Secretary
Meierding, Wm. A. ..... Springfield

Adams, James L. ..... Morgan
Jamieson, Earl ..... Walnut Grove
Meierding, Wm. A. ..... Springfield
Rothenberg, J. C. ..... Springfield
Shrader, J. S. ..... Springfield
Strickler, Mary ..... Sleepy Eye
Sundt, Mathias ..... Hanska
Walker, C. C. ..... Lamberton

Lyon-Lincoln County Medical Society

Regular meetings, first Tuesday in February, May, July and October
Annual meeting in February

President
Hoidale, A. D. ..... Tracy

Secretary
Workman, Harper M. ..... Tracy

Bacon, C. G. ..... Marshall
Bossingham, O. N. ..... Lake Benton
Hoidale, A. D. ..... Tracy
Jensen, J. C. ..... Hendricks
Persons, C. E. ..... Marshall
Robertson, J. B. ..... Cottonwood
Sanderson, E. T. ..... Minneota
Thordardson, Theo. ..... Minneota
Vadheim, A. L. ..... Tyler
Valentine, W. H. ..... Tracy
Workman, H. M. ..... Tracy
Workman, W. G. ..... Tracy

SIXTH DISTRICT

COUNCILOR, F. R. WEISER, (1 year) ..... Windom

Southwestern Minnesota Medical Society

Pipestone, Rock, Nobles, Murray, and Cottonwood Counties
Regular meetings, second Thursday in May and November
Annual meeting in November

President
McKeown, E. G. ..... Pipestone

Secretary
Watson, F. G. ..... Worthington

Allin, R. W. ..... Heron Lake
Arnold, E. W. ..... Adrian
Balcom, G. G. ..... Lake Wilson
Bong, J. H. ..... Jasper
Brown, A. H. ..... Pipestone
Chadbourne, A. G. ..... Heron Lake
Cross, P. J. ..... Ellsworth
De Boer, Hermanus ..... Edgerton
Dohms, H. C. ..... Slayton
Dolan, C. P. ..... Worthington
Dudley, J. H. ..... Windom
Goldberg, M. L. ..... Jasper
Goldon, C. M. ..... Ruthon
Hilger, J. M. ..... Iona
Hitchings, W. P. ..... Lakefield
Jenckes, H. D. ..... Pipestone
Knudtson, H. M. ..... Pipestone
Leebens, J. H. ..... Lismore
Lowe, Thos. ..... Pipestone
McCrea, James ..... Fulda
McIntyre, John A. ..... Round Lake
McKeown, E. G. ..... Pipestone
Maitland, David P. ..... Jackson
Manson, F. M. ..... Worthington
May, C. C. ..... Adrian
Metcalf, F. W. ..... Fulda
Mork, B. O. ..... Worthington
Patterson, N. E. ..... Worthington
Piper, Wm. A. ..... Mountain Lake
Ravn, B. ..... Windom
Richardson, W. E. ..... Pipestone
Richmond, Chas. D. ..... Jeffers
Rose, J. T. ..... Lakefield
Sherman, C. L. ..... Luverne
Smallwood, J. T. ..... Worthington
Sogge, L. ..... Windom
Spalding, A. E. ..... Luverne
Stanley, Court R. ..... Fulda
Taylor, Wm. J. ..... Pipestone
Thorson, E. O. ..... Luverne
Tofti, Josephine ..... Pine City
Waller, Jos. D. ..... Wilmont
Watson, F. G. ..... Worthington
Weedow, Henry ..... Worthington
Weiser, F. R. ..... Windom
Williams, A. L. ..... Slayton
Wright, C. O. ..... Luverne

Blue Earth Valley Medical Society

Regular meetings, fourth Thursday, May and October
Annual meeting, fourth Thursday May

President
Broberg, J. A.....Blue Earth
Secretary
Hunt, R. C.....Fairmont
Bailey, H. B.....Ceylon
Blong, P. H.....Elmore
Broberg, J. A.....Blue Earth
Butz, J. A.....Monterey
Chambers, W. C.....Blue Earth
Dewey, G. W.....Fairmont
Farrage, J. H.....Winnebago City
Farrish, R. C.....Sherburn
Gough, W. H.....Granada
Gullixson, A.....Bricelyn
Holm, P. F.....Wells
Hunt, F. N.....Fairmont
Hunt, R. C.....Fairmont
Hunte, A. F.....Truman
Jacobs, A. C.....Elmore
Logan, F. W.....Blue Earth
Luedtke, G. H.....Fairmont
McGwarty, J. J.....Easton
Richardson, W. J.....Fairmont
Strobel, W. G.....Welcome
Urstad, O. H.....Kiester
Wilson, C. E.....Blue Earth

Watonwan County Medical Society

Regular meetings, none
Annual meeting, December

President
McCarthy, W. J.....Madelia
Secretary
Haynes, B. H.....St. James
Grimes, H. B.....Madelia
Hagen, O. E.....Butterfield
Haynes, B. H.....St. James
Kabrick, O. A.....Odin
Lisar, G. M.....St. James
McCarthy, W. J.....Madelia
Rowe, W. H.....St. James
Thompson, Albert.....St. James

SEVENTH DISTRICT

COUNCILOR, F. A. DODGE, M. D. (2 years).....Le Sueur

Nicollet-LeSueur County Medical Society

Regular meetings, September and December
Annual meeting, Second Tuesday in December

President
Baskett, Olive T.....St. Peter
Secretary
Le Clerc, J. E.....Le Sueur
Aitkins, H. B.....Le Sueur Center
Baskett, Geo. T.....St. Peter
Baskett, Olive T.....St. Peter
Blakely, C. C.....St. Peter
Covell, W. W.....St. Peter
Daniels, J. W.....St. Peter
Dodge, F. A.....Le Sueur
Freeman, Geo. H.....Willmar
Hartung, H. H.....Le Sueur
Le Clerc, J. E.....Le Sueur
McDougald, D. W.....Le Sueur
McIntyre, G. W.....St. Peter
Merritt, G. F.....St. Peter
Olson, R. G.....Nicollet
Phelps, R. M.....St. Peter
Strathern, F. P.....St. Peter
Woodworth, L. F...Le Sueur Center

McLeod County Medical Society

Regular meetings, January, April, July, October
Annual meeting, January

President
Clement, J. B.....Lester Prairie
Secretary
Maurer, E. L.....Brownton
Axilrod, D. L.....Hutchinson
Barrett, E. E.....Glencoe
Bolles, D. W.....Minneapolis
Clement, J. B.....Lester Prairie
Maurer, E. L.....Brownton
Sheppard, Fred.....Hutchinson
Sheppard, P. E.....Hutchinson
Tinker, C. W.....Stewart

Scott-Carver Medical Society

Regular meetings, first Thursday March, June, September, December
Annual meeting, first Thursday in December

President
Landenberger, John....New Prague
Secretary
Reiter, H. W.....Shakopee
Von Bohland, F. J.....Belle Plaine
Buck, Fred H.....Shakopee
Cannady, E. E.....Prior Lake
Fischer, H. P.....Shakopee
Fischer, P. M.....Shakopee
Hendricksen, H. G.....New Market
Landenberger, John....New Prague
Maertz, W. F.....New Prague
Moloney, G. R.....New Prague
Novak, E. E.....New Prague
Phillips, Wm. H.....Jordan
Reiter, H. W.....Shakopee
Schneider, H. A.....Jordan
White, J. B.....Belle Plaine

Goodhue County Medical Society

Regular meetings, January, April, July, October
Annual meeting, January 15th, 1920

President
Conley, Alva A.....Cannon Falls
Secretary
Werner, N. F.....Red Wing
Claydon, L. E.....Red Wing
Conley, A. A.....Cannon Falls
Conley, H. E.....Cannon Falls
Cremer, M. H.....Red Wing
Jones, A. W.....Red Wing
Sawyer, H. P.....Goodhue
Smith, M. W.....Red Wing
Werner, N. F.....Red Wing

Rice County Medical Society

Regular meetings, first Wednesday, January, April, July, October
Annual meeting, first Wednesday in January

President
Robilliard, W. H.....Faribault
Secretary
Davis, Fred U.....Faribault

Babcock, F. M.....Northfield
Davis, F. U.....Faribault
Haessley, S. B.....Faribault
Hanson, A. M.....Faribault
Hunt, W. A.....Northfield
Huxley, F. R.....Faribault
Lane, Laura A.....Faribault
Lee, W. P.....Northfield
Lexa, F. J.....Lonsdale
Mayland, M. L.....Faribault
Morse, W. E. H.....Morristown
Phillips, J. G.....Northfield
Plonske, C. J.....Faribault
Robilliard, C. M.....Faribault
Robilliard, W. H.....Faribault
Rumpf, W. H.....Faribault
Smith, P. A.....Faribault
Theissen, W. H.....Faribault
Traeger, C. A.....Faribault
Warren, F. S.....Faribault
Weinburgh, W. H.....Waterville
Wilson, Warren .....Northfield

Wabasha County Medical Society

Regular meetings, annually first Thursday after first Monday in July

President
Slocumb, J. A.....Plainview
Secretary
Wilson, W. F.....Lake City

Bayley, E. H.....Lake City
Bowers, H. E.....Lake City
Bowers, J. T.....Lake City
Dempsey, D. P.....Kellogg
Fleischhauer, D. S.....Wabasha
French, E. A.....Plainview
Heagerty, W. B.....Mazeppa
Radabaugh, R. C.....Hastings
Rankin, A. A.....Zumbro Falls
Schmidt, G. .....Lake City
Slocumb, J. A.....Plainview
Wilson, W. F.....Lake City

EIGHTH DISTRICT

Councilor, W. F. Braasch, M. D. (3 years).....Rochester

Blue Earth County Medical Society

Regular meetings, last Monday of each month
Annual meeting, last Monday in December

President
Pratt, C. C.....Mankato
Secretary
Osborn, Lida .....Mankato

Andrews, J. W.....Mankato
Andrews, R. N.....Mankato
Benham, E. W.....Mankato
Black, Wm.....Mankato
Dahl, G. A.....Mankato
Denman, A. V.....Mankato
Franchere, F. W.....Lake Crystal
Hielscher, Helen .....Mankato
Hielscher, J. A.....Mankato
Holbrook, J. S.....Mankato
Holman, C. J.....Mankato
James, J. H.....Mankato
Kelly, T. C.....Mankato
Kemp, A. F.....Mankato
Liedloff, A. G.....Mankato
Lloyd, H. J.....Mankato
Merrill, J. E.....Amboy
Miller, V. J.....Mankato
Osborn, Lida .....Mankato
Pratt, C. C.....Mankato
Schlesselman, J. T.....Mankato
Schmitt, A. F.....Mankato
Sohmer, A. E.....Mankato
Wentworth, A. J.....Mankato
Williams, Hugh O.....Lake Crystal
Williams, John .....Lake Crystal
Wohlrabe, A. A.....Mankato

Houston-Fillmore County Medical Society

Regular meetings, May, August, October
Annual meeting, October

President
Helland, G. M.....Spring Grove
Secretary
Fischer, O. F.....Houston

Anderson, Norman E.....Harmony
Browning, W. E.....Caledonia
Collins, J. S.....Caledonia
Drake, F. A.....Lanesboro
Eby, Cyrus B.....Spring Valley
Fischer, O. F.....Houston
Foster, Bainbridge....Spring Valley
Grinnell, W. B.....Preston
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Johnson, Chas. H.....Spring Valley
Kendrick, W. N.....Spring Valley
Kibbe, O. A.....Canton
Kierland, P. E.....Harmony
Lannin, J. C.....Mabel
Lommen, A. P.....Lanesboro
Love, George A.....Preston
Nass, H. A.....Mabel
Nelson, M. S.....Spring Grove
Onsgard, C. K.....Rushford
Onsgard, L. K.....Houston
Rhines, D. C.....Caledonia
Sather, E. R.....Spring Valley
Simons, E. V.....Spring Valley
Tierney, C. M.....Granger
Utley, J. D.....St. Paul
Walker, Jas. D.....Wykoff
Williams, R. V.....Rushford
Woodruff, C. W.....Chatfield

Mower County Medical Society

Regular meetings, second Wednesday in January, April, July and October
Annual meeting, second Wednesday in October

President
Hartel, G. E.....Austin
Secretary
Baker, G. L.....Austin

Allen, A. W.....Austin
Allen, C. C.....Austin
Baker, G. L.....Austin
Coleman, F. B.....Austin
Grise, W. B.....Austin
Hart, M. J.....Le Roy
Hegge, C. A.....Austin
Hegge, O. H.....Austin
Henslin, A. E.....Le Roy
Hartel, G. E.....Austin
Leck, C. C.....Austin
Lewis, C. F.....Austin
Melzer, G. R.....Lyle
Mitchell, R. S.....Grand Meadow
Moore, W. J.....Adams
Morse, M. P.....Le Roy
Pierson, H. F.....Austin
Rebman, E. C.....Austin
Schottler, G. J.....Dexter
Torkelson, P. T.....Lyle
Ward, W. J.....Rose Creek
Warren, C. L.....Le Roy

Olmstead County Medical Society

Regular meetings, April, June, September, December
Annual meeting, first Wednesday in December

President
Russell, H. R.....Stewartville
Secretary
Pollock, Lee W.....Rochester

Adson, A. W.....Rochester
Allen, W. A.....Rochester
Archibald, A. A.....Rochester
Asbury, J. F.....Rochester
Balfour, D. C.....Rochester
Barlow, R. A.....Rochester
Benedict, W. L.....Rochester
Berkman, D. M.....Rochester
Bleifus, W. F.....Rochester
Bonness, Hazel .....Rochester
Bowing, H. H.....Rochester
Braasch, W. F.....Rochester
Broders, A. C.....Rochester
Bumpus, H. C.....Rochester
Crenshaw, J. L.....Rochester
Crewe, J. E.....Rochester
Dolder, F. C.....Eyota
Eusterman, G. B.....Rochester
Evarts, Arah B.....Rochester
Fawcett, C. E.....Stewartville
Fisher, Carl .....Rochester
Gamble, J. W.....Rochester
Giffin, H. Z.....Rochester
Graham, Christopher ....Rochester
Grainger, C. F.....Rochester
Grainger, S. Booker.....Rochester
Hallenbeck, D. F.....Rochester
Hayes, James M.....Rochester
Henderson, M. S.....Rochester
Heyerdale, O. C.....Rochester
Hollberg, C. A.....Rochester
Howard, S. E.....Rochester
Huffman, R. W.....Elgin
Hunt, V. C.....Rochester
Joyce, S. T.....Rochester
Judd, E. S.....Rochester
Kilbourne, A. F.....Rochester
Lemon, W. S.....Rochester
Lillie, H. I.....Rochester
Linton, W. B.....Rochester
Logan, A. H.....Rochester
Lyon, H. R.....Rochester
Mark, A. E.....Rochester
Masson, J. C.....Rochester
Mayo, C. H.....Rochester
Mayo, W. J.....Rochester
Melson, O. C.....Rochester
Meyerding, H. W.....Rochester
Moore, A. B.....Rochester
Mosse, F. R.....Rochester
Muehlig, G. F.....Rochester
Mussey, R. D.....Rochester
New, G. B.....Rochester
Ohlinger, L. B.....Rochester
Pemberton, J. deJ.....Rochester
Piper, M. C.....Rochester
Plummer, H. S.....Rochester
Plummer, W. A.....Rochester
Pollock, Lee W.....Rochester
Prangen, A. D.....Rochester
Rosenow, E. C.....Rochester
Russell, H. R.....Stewartville
Sanford, A. H.....Rochester
Sheldon, W. D.....Rochester
Sistrunk, W. E.....Rochester
Smith, F. L.....Rochester
Stacy, L. J.....Rochester
Steven, Geo. .....Byron
Stokes, J. H.....Rochester
Szlapka, T. L.....Rochester
White, P. A.....Rochester
Willius, F. A.....Rochester
Wilson, L. B.....Rochester
Witherstine, H. H.....Rochester

Waseca County Medical Society

Regular meetings, second Monday in December
Annual meeting, second Monday in December

President
Chamberlin, W. A.....Waseca
Secretary
Rudolf, A. J.....Waseca

Blanchard, H. G.....Waseca
Chamberlin, W. A.....Waseca
Cory, W. M.....Waterville
Hagen, H. O.....New Richland
Joyce, T. M.....Janesville
Lynn, J. F.....Waseca
McIntire, H. M.....Waseca
O'Hara, J. J.....Janesville
Rudolf, A. J.....Waseca
Swartwood, F. A.....Waseca

Winona County Medical Society

Regular meetings, first Tuesday January, April, July, October
Annual meeting in January

President
Lester, C. A.....Winona
Secretary
Robbins, C. P.....Winona

Bear, H. C.....St. Charles
Benoit, F. T.....Winona
Clay, F. H.....St. Charles
Gates, G. L.....Winona
Heise, W. F. C.....Winona
Keyes, E. D.....Winona
Leicht, Oswald .....Winona
Lester, C. A.....Winona
Lichtenstein, Hans .....Winona
Lindsay, W. V.....Winona
Lynch, J. L.....Winona
McLaughlin, E. M.....Winona
Neuman, C. A.....Lewiston
Neuman, W. A.....Lewiston
Nauth, W. H.....Winona
Pritchard, D. B.....Winona
Robbins, C. P.....Winona
Rollins, F. H.....St. Charles
Rosenberg, B. P.....Winona
Schaefer, S.....Winona
Scott, J. W.....St. Charles
Stachniewiez, V. J.....Winona
Steiner, Irving.....Winona
Tweedy, G. J.....Winona

Freeborn County Medical Society

Regular meetings, quarterly
Annual meeting in May

President
Von Berg, J. P.....Albert Lea
Secretary
Stevenson, R. G.....Albert Lea

Bessesen, W. A.....Albert Lea
Burns, H. D.....Albert Lea
Buttruff, C. R.....Freeborn
Calhoun, F. W.....Albert Lea
Davis, F. W.....Alden
Freeman, J. P.....Glenville
Kamp, B. A.....Albert Lea
McCreight, Geo. .....Albert Lea
Nannestad, J. R.....Albert Lea
Palmer, W. L.....Albert Lea
Schultz, J. A.....Albert Lea
Stevenson, R. G.....Albert Lea
Von Berg, J. P.....Albert Lea

ALPHABETICAL ROSTER

Abbott, A. W.....Minneapolis
Abbott, J. S.....St. Paul
Abbott, Wm. P.....Duluth
Abramovich, J. H.....St. Paul
Adair, F. L.....Minneapolis
Adair, John H.....Owatonna
Adams, B. S.....Hibbing
Adams, J. L.....Morgan
Adams, R. C.....Bird Island
Adkins, C. M.....Grygla
Adson, A. W.....Rochester
Aherns, A. E.....St. Paul
Aherns, A. H.....St. Paul
Aitkins, H. B.....LeSueur Center
Alden, J. F.....St. Paul
Aldes, Harry.....St. Paul
Aldrich, F. H.....Belview
Alexander, F. H.....St. Paul
Allaben, Gerald R.....Buhl
Allen, A. W.....Austin
Allen, C. C.....Austin
Allen, F. A.....Crosby
Allen, F. H.....Staples
Allen, H. W.....Minneapolis
Allen, Mason.....St. Paul
Allen, R. W.....Heron Lake
Allen, Wilson A.....Rochester
Ancker, A. B.....St. Paul
Anderson, A. E.....Minneapolis
Anderson, Arndt G.....Minneapolis
Anderson, C. A.....Rush City
Anderson, Norman E.....Harmony
Andrews, J. W.....Mankato
Andrews, Roy M.....Mankato
Andrist, J. W.....Owatonna
Araouni, Khalil.....St. Paul
Archibald, A.....Rochester
Archibald, F. M.....Mahnomen
Arends, Archibald.....St. Paul
Arey, H. C.....Excelsior
Arminen, R. V.....Duluth
Armstrong, J. M.....St. Paul
Arnold, E. W.....Bigelow
Arzt, C. P.....St. Paul
Asbury, J. F.....Rochester
Aurand, W. H.....Minneapolis
Ausman, Carl F.....Paynesville
Avery, J. Fowler.....Minneapolis
Axilrod, D. L.....Hutchinson
Ayers, Geo. T.....Ely

Babcock, F. M.....Northfield
Bacon, C. G.....Marshall
Bacon, H. P.....Milaca
Bacon, Knox.....St. Paul
Bacon, L. C.....St. Paul
Bacon, R. S.....Montevideo
Badeaux, Geo. T.....Brainerd
Bagley, W. R.....Duluth
Baier, Florence C.....Minneapolis
Bailey, H. B.....Ceylon
Baker, G. L.....Austin
Baker, H. A.....Minneapolis
Balcom, G. G.....Lake Wilson
Balcome, F. E.....St. Paul
Baldwin, L. B.....Minneapolis
Balfour, Donald C.....Rochester
Ball, C. R.....St. Paul
Barlow, R. A.....Rochester
Barney, Leon C.....Duluth
Barrett, E. E.....Glencoe
Barron, Moses.....Minneapolis
Barsness, Nellie.....St. Paul
Barton, E. K.....Minneapolis
Baskett, Geo. T.....St. Peter
Baskett, Olive T.....St. Peter
Baxter, S. H.....Minneapolis
Bayley, E. H.....Lake City
Beach, Geo. Wm.....Cacak, Serbia
Beadie, W. D.....Cannon Falls
Beals, Hugh.....St. Paul
Bear, H. C.....St. Charles
Beaty, J. H.....St. Cloud
Beckley, F. L.....St. Paul
Beebe, Warren L.....St. Cloud
Beise, R. A.....Brainerd
Bell, J. Warren Jr.....Minneapolis
Bell, J. W.....Minneapolis
Benedict, E. E.....Minneapolis
Benedict, W. L.....Rochester
Benepe, L. M.....St. Paul
Benham, E. W.....Mankato
Benjamin, A. E.....Minneapolis
Benn, F. G.....Minneapolis
Bennion, P. H.....St. Paul
Benoit, F. T.....Winona
Benson, G. E.....Minneapolis
Benson, Iver S.....Minneapolis
Bentley, Norman P.....St. Paul
Bergh, L. M.....Montevideo
Bergquist, K. E.....Duluth
Berkman, D. M.....Rochester
Berrisford, P. D.....St. Paul
Bertelsen, O. L.....Crookston
Bessesen, A. N.....Minneapolis
Bessesen, W. A.....Albert Lea
Bettingen, J. W.....St. Paul
Biederman, J....Thief River Falls
Binet, H. E.....Grand Rapids
Binger, H. E.....St. Paul
Bishop, Chas. W.....Minneapolis
Bissell, Frank S.....Minneapolis
Black, Wm.....Mankato
Blacklock, S. S.....Hibbing
Blakley, C. C.....St. Peter
Blanchard, H. G.....Waseca
Blegen, H. M.....Warren
Bleifuss, W. F.....Rochester
Blong, P. H.....Elmore
Bock, R. A.....St. Paul
Boeckmann, Eduard.....St. Paul
Boeckmann, Egil.....St. Paul
Boehm, J. C.....St. Cloud
Bohland, E. H.....St. Paul
Bohland, F. J. von....Belle Plaine
Bohling, Bernard S.....Sandstone
Bole, R. S.....St. Paul
Boleyn, E. S.....Stillwater
Bolles, D. W.....Minneapolis
Bolsta, Charles.....Ortonville
Bolstad, H. C.....St. Paul
Bone, Merle.....Kelliher
Bong, J. H.....Jasper
Bonness, Hazel.....Rochester
Booth, A. E.....Minneapolis
Boreen, Clifton A.....Minneapolis
Borreson, B.....Warren
Bossingham, O. M....Lake Benton
Bouman, H. A.....Minneapolis
Boutelle, Louisa E.....Minneapolis
Bowers, H. E.....Lake City
Bowers, J. T.....Lake City
Bowing, H. H.....Rochester
Boyer, S. H.....Duluth
Braasch, W. F.....Rochester
Bracken, H. M.....Minneapolis
Braden, A. J.....Duluth
Branton, B. J.....Willmar
Bratrud, A. F.....Minneapolis
Bratrud, O. E.....Fertile
Bratrud, Theo.....Warren
Bray, C. W.....Biwabik
Bray, E. R.....St. Paul
Briggs, F. W.....Fargo
Brigham, C. F.....St. Cloud
Brimhall, J. B.....St. Paul
Brinberg, T. L.....St. Paul
Broberg, J. A.....Blue Earth
Brodie, Walter D.....St. Paul
Broders, A. C.....Rochester
Brooks, Chas. M.....Minneapolis
Brooks, D. F.....St. Paul
Brown, A. H.....Pipestone
Brown, E. D.....Minneapolis
Brown, E. I.....St. Paul
Brown, E. J.....Minneapolis
Brown, J. C.....St. Paul
Brown, Paul F.....Minneapolis
Brown, R. S.....Minneapolis
Brown, S. E.....St. Paul
Browning, W. E.....Caledonia
Brunet, L. M.....Cloquet
Buck, Fred H.....Shakopee
Buckley, E. W.....St. Paul
Bullen, F. V.....Hibbing
Bumpus, H. C.....Rochester
Burch, F. E.....St. Paul
Burfiend, G. H.....Afton
Burns, F. W.....St. Paul
Burns, H. D.....Albert Lea
Burns, H. J.....Duluth
Burns, M. A.....Milan
Burns, R. M.....St. Paul
Bushey, M. E.....Arlington
Buttruff, C. R.....Freeborn
Butz, J. A.....Monterey
Byrnes, W. J.....Minneapolis
Cabot, Verne S.....Browerville
Caine, C. E.....Morris
Calhoun, Frank W.....Albert Lea
Cameron, J. A.....St. Paul
Camp, W. E.....Minneapolis
Campbell, A. A.....Ogema
Campbell, E. P.....St. Paul
Campbell, L. M.....Minneapolis
Campbell, J. E.....So. St. Paul
Campbell, R. A.....Minneapolis
Cannady, E. E.....Prior Lake
Cannon, C. M.....St. Paul
Cannon, Harry.....St. Paul
Carlaw, C. M.....Minneapolis
Carman, Chas. L.....St. Paul
Carman, J. E.....Detroit
Carman, Paul I.....St. Paul
Carroll, Wm. C.....St. Paul
Carstens, C. F.....Hibbing
Cosgrove, J. H.....Duluth
Catlin, John J.....Buffalo
Catlin, T. J.....Palisade
Cavanaugh, J. O.....St. Paul
Chamberlain, J. W.....St. Paul
Chamberlain, W. A.....Waseca
Chambers, W. C.....Blue Earth
Chapman, O. S.....Minneapolis
Chapman, T. L.....Duluth
Chapman, W. E.....Litchfield
Chadbourn, A. G.....Heron Lake
Chatterton, C. C.....St. Paul
Cheleen, S. J.....Minneapolis
Cheney, E. L.....Duluth
Chowning, W. M.....Minneapolis
Christenson, C. R.....Morris
Christianson, Andrew.....St. Paul
Christie, G. R.....Long Prairie
Christison, J. T.....St. Paul
Cirkler, A. A.....Minneapolis
Clark, F. F.....Duluth
Clark, G. E.....Stillwater
Clark, Harry B.....St. Cloud
Clark, H. S.....Minneapolis
Clark, T. C.—
Soldiers Home, Minneapolis
Clay, E. M.....Renville
Clay, F. H.....St. Charles
Claydon, L. E.....Red Wing
Clement, J. B.....Lester Prairie
Clifton, Theodore A.....Isanti
Conheim, Eva.....St. Paul
Cobb, S. G.....St. Paul
Cochrane, W. J.....Minneapolis
Cole, Herman B....Redwood Falls
Cole, Wallace.....St. Paul
Coleman, F. B.....Austin
Coller, H. G.....Brainerd
Collins, Arthur N.....Duluth
Collins, Homer C.....Duluth
Collins, J. S.....Caledonia
Colvin, A. R.....St. Paul
Comstock, A. E.....St. Paul
Condit, W. H.....Minneapolis
Conley, A. A.....Cannon Falls
Conley, H. E.....Cannon Falls
Cook, Paul B.....St. Paul
Cooney, H. C.....Princeton
Corbett, J. F.....Minneapolis
Corrigan, J. E.....Baudette
Cory, Wm.....Waterville
Cosman, E. O.....Minneapolis
Courtney, Walter.....Brainerd
Covell, W. W.....St. Peter
Coventry, W. A.....Duluth
Cowern, E. W.....No. St. Paul
Conner, Wm. H.....Finlayson
Crafts, L. M.....Minneapolis
Crandall, A. M.....Madison
Cremer, M. H.....Red Wing
Crenshaw, John L.....Rochester
Cress, P. J.....Ellsworth
Crewe, John E.....Rochester
Crowe, J. H.....Virginia
Crume, Geo. P.....Minneapolis
Cutts, Geo.....Minneapolis

Dahl, G. A.....Mankato
Dahlquist, G. W.....Lancaster
Daignault, Oscar .....Benson
Dampier, C. E.....Crookston
Daniels, J. W.....St. Peter
Danielson, Karl A.....Litchfield
Darling, J. B.....St. Paul
Darrow, Daniel C.....Moorhead
Daugherty, E. B.....St. Paul

Daugherty, L. E.....St. Paul
Davis, F. U.....Faribault
Davis, F. W.....Alden
Davis, Herbert.....St. Paul
Davis, Lloyd T.....Wadena
Davis, Luther A.....Wadena
Davis, Wm. .....St. Paul
Davison, P. C.....Willmar
DeBoer, Hermanus.....Edgerton
Dedolph, Karl.....St. Paul
Dempsey, D. P.....Kellogg
Denman, Austin V.....Mankato
Dennis, W. A.....St. Paul
Dewey, G. W.....Fairmont
Deziel, G.....Minneapolis
Dickson, T. H. Jr.....St. Paul
Disen, C. F.....Minneapolis
Dittman, Geo. C.....St. Paul
Dodge, Franklin A.....Le Sueur
Dohm, A. J.....St. Paul
Dohni, W. M.....Farmington
Dolan, C. P.....Worthington
Dolder, F. C.....Eyota
Doms, H. C.....Slayton
Donaldson, C. A.....Minneapolis
Donovan, J. J.....Litchfield
Doolittle, E. F.....Duluth
Doupe, R. G.....Upsala
Doxey, G. L.....Minneapolis
Drake, C. B.....St. Paul
Drake, C. R.....Minneapolis
Drake, F. A.....Lanesboro
Dredge, H. P.....Sandstone
Dreisbach, N.....Minneapolis
Drenning, F. C.....Duluth
Dryden, F. M.....Crookston
DuBois, Julian.....Sauk Center
Duclos, J. A.....Henderson
Dudley, J. H.....Windom
Dulude, S. .....Dassel
Dunlop, A. H.....Crookston
Dunn, John B.....St. Cloud
Dunsmoor, F. A.....Minneapolis
Dutton, C. E.....Minneapolis

Earl, George A.....St. Paul
Earl, R. O.....St. Paul
Eberlin, E. A.....Glenwood
Eby, Cyrus B.....Spring Valley
Egan, John M.....Minneapolis
Eggen, O. K.....Minneapolis
Eisengraeber, G. A...Granite Falls
Eitel, Geo. G.....Minneapolis
Eklund, J. J.....Duluth
Eklund, Wm. J.....Duluth
Elias, F. J....Morgan Park, Duluth
Elsey, J. R.....Glenwood
Ely, Orriman S.....So. St. Paul
Engberg, Ed. J.....St. Paul
Erb, Frederick A.....Minneapolis
Erdmann, Chas. A.....Minneapolis
Erickson, J. G.....Minneapolis
Ernest, Geo. C.....St. Paul
Ertel, E. Q.....Ellendale
Eshelby, E. C.....St. Paul
Essing, C. F.....Wheaton
Eusterman, Geo. B.....Rochester
Evarts, Arah B.....Rochester
Evert. J. A.....Brainerd

Fahey, E. W.....Duluth
Fankbonner, A. V.....Hatley
Fansler, W. A.....Minneapolis
Farmer, J. C.....McKinley
Farr, R. E.....Minneapolis
Farrage, James .....Winnebago
Farrish, R. C.....Sherburn
Fawcett, Chas. E.....Stewartville
Feidt, W. W.....Minneapolis
Ferguson, Jas. B.....St. Paul
Ferguson, J. C.....St. Paul
Fischer, H. P.....Shakopee
Fischer, O. F.....Houston
Fischer, P. M.....Shakopee
Fischer, Carl .....Rochester
Fitzgerald, E. T.....Morris
Fjelstad, C. A.....Austin
Fleischhauer, D. S.....Wabasha
Fleming, A. S.....Minneapolis
Fleming, James .....Cloquet
Flower, W. Z.....Minneapolis
Fogarty, Chas. W.....St. Paul
Forhes, R. S.....Duluth
Foster, Bainbridge...Spring Valley
Franchere, F. W.....Lake Crystal
Franzen, H. G.....Minneapolis
Frazier, Geo. W.....Hill City
Freed, O. J.....Cokato
Freeman, Chas. D.....St. Paul
Freeman, Geo. H.....Willmar
Freeman, J. P.....Glenville
Freeman, W. L.....Foley
Freligh, E. O'B.....Stillwater
French, E. A.....Plainview
Frieslehen, Wm.....Sauk Rapids
Froelich, H. W...Thief River Falls
Frost, E. H.....Willmar
Fulton, John.....St. Paul
Furber, W. W.....Cottage Grove

Gager, E. C.....St. Paul
Gaines, E. C.....Buffalo Lake
Gamble, J. W.....Rochester
Gammell, H. W.....Madison
Gardner, E. L.....Minneapolis
Garlock, A. V.....Bemidji
Gates, G. L.....Winona
Geist, Geo. A.....St. Paul
Gelz, John J.....Stearns-Benton
Gendron, J. F. H.....Grand Rapids
Ghent, M. M.....St. Paul
Ghostley, Mary..International Falls
Gibbon, L. L.....Lowry
Giessler, Paul W.....Minneapolis
Giffin, H. Z.....Rochester
Gilfillan, J. S.....St. Paul
Gillespie, N. H.....Duluth
Gillette, A. J.....St. Paul
Gilmore, R. T.....Bemidji
Ginsberg, Wm.....So. St. Paul
Glyer, R. T.....Brooten
Goehrs, H. W.....Melrose
Goldberg, M. L.....Jasper
Golden, C. M.....Ruthton
Goltz, E. V.....St. Paul
Goodheart, C. J.....Akely
Gordon, G. J.....Minneapolis
Gosslee, G. L.....Moorhead
Gotham, C. L.....St. Paul
Gough, W. H.....Granada
Graham, C.....Rochester
Graham, David.....Duluth
Graham, R.....Duluth
Granger, C. F.....Rochester
Granger, Gertrude B.....Rochester
Graves, Carlton.....Aitkin
Grawn, F. A.....Duluth
Gray, C. E.....Rush City
Greeley, L. Q.....Duluth
Greene, Chas. Lyman.....St. Paul
Greene, E. K.....Minneapolis
Grimes, H. B.....Madelia
Grinnell, W. B.....Preston
Grise, W. B.....Austin
Groves, A. F.....Brainerd
Guilford, H. M.....Minneapolis
Gullixson, Andrew .....Bricelyn
Gumper, Jos. B.....Becker
Gunderson, R. M.....Lake Park
Gunz, A. N.....Center City
Guyer, Leo George.....Waseca

Hacking, F. H.....Minneapolis
Haessley, S. B.....Faribault
Hagaman, Geo. K.....St. Paul
Hagen, H. O.....New Richland
Hagen, O. E.....Butterfield
Hagen, Ole J.....Moorhead
Haggard, G. D.....Minneapolis
Haight, G. G.....Audubon
Haines, J. H.....Stillwater
Hall, A. R.....St. Paul
Hall, J. M.....Minneapolis
Hall, Pearl M....State Sanatorium
Hallenback, Dorr F.....Rochester
Hallowell, W. H.....Minneapolis
Hamel, C. E.....Minneapolis
Hamilton, A. S.....Minneapolis
Hammes, E. M.....St. Paul
Hammond, J. F.....St. Paul
Haney, C. L.....Duluth
Hansen, Erling W.....Minneapolis
Hansen, Olga S.....Minneapolis
Hanson, A. M.....Faribault
Hare, Earle R.....Minneapolis
Harriman, L.....Howard Lake
Harrington, C. D.....Minneapolis
Hart, A. B.....Owatonna
Hart, M. J.....LeRoy
Hartung, H. A.....Le Sueur
Hartzell, Thos. B.....Minneapolis
Hauge, M. M.....Clarkfield
Havens, J. G. W.....Owatonna
Haverfield, Addie R....Minneapolis
Hawkins, E. P.....Montrose
Hawkins, V. J.....St. Paul
Hayes, Jas. M.....Rochester
Haynes, B. H.....St. James
Haynes, F. E.....Minneapolis
Head, Geo. Douglas....Minneapolis
Heagerty, W. B.....Mazeppa
Healy, R. T.....Pierz
Heath, A. C.....St. Paul
Hedback, A. E.....Minneapolis
Hegge, C. A.....Austin
Hegge, O. H.....Austin
Heimark, O. E.....Duluth
Heise, W. C. F.....Winona
Helk, H. H.....Minneapolis
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Hemstead, Werner.....St. Cloud
Henderson, A...Powell River, B. C.
Henderson, M. S.....Rochester
Hendrickson, J. F.....Minneapolis
Hengstler, W. H.....St. Paul
Henriksen, H. G.....New Market
Hensel, Chas. N.....St. Paul
Henslin, A. E.....LeRoy
Hertel, G. E.....Austin
Heseltine, V. G.....Taylors Falls
Hesselgrave, S. S.....St. Paul
Heyerdale, O. C.....Rochester
Hielscher, Helen H.....Mankato
Hielscher, J. A.....Mankato
Higgins, J. H.....Minneapolis
Higgs, Walter W.....Park Rapids
Hilbert, Pierre A.....Melrose
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
Hilger, J. M.....Iona
Hilger, L. A.....St. Paul
Hill, Eleanor J.....Minneapolis
Hill, R. J.....Minneapolis
Hirschboeck, F. J.....Duluth
Hirschfield, M. S.....Duluth
Hitchings, Wm. S.....Lakefield
Hobbs, C. A.....Minneapolis
Hodgson, H. H.....Crookston
Hoff, Alfred .....St. Paul
Hoff, Peder A.....St. Paul
Hoidale, A. D.....Tracy
Hoit, Edward E.....Detroit
Holbrook, J. S.....Mankato
Holcomb, J. T.....St. Paul
Holcomb, O. W.....St. Paul
Holdridge, Geo. A.....Foley
Holl, P. M.....Minneapolis
Hollands, Wm. H.....Fisher
Hollberg, C. A.....Rochester
Holm, H. H.....Cokato
Holm, P. F.....Wells
Holman, C. J.....Mankato
Holman, E. E.....Pine River
Holmberg, L. J.....Canby
Holmes, W. B.....Ada
Holst, C. F.....Little Falls
House, Z. E.....Cass Lake
Houston, C. A.....Park Rapids
Hovde, Hans N.....Duluth
Howard, S. E.....Rochester
Howe, A. W.....Minneapolis
Hubert, R. I.....Bellflower, Cal.
Huenekens, E. J.....Minneapolis
Huffman, R. W.....Elgin
Hullsiek, Harold E.....St. Paul
Hulsman, L. J.....Marble
Humphrey, E. W.....Moorhead
Humphrey, W. R.....Stillwater
Hunt, F. N.....Fairmont
Hunt, H. E.....St. Paul
Hunt, R. C.....Fairmont
Hunt, V. C.....Rochester
Hunt, W. A.....Northfield
Hunte, A. F.....Truman
Hursh, M. M.....Grand Rapids
Huxley, Fred R.....Faribault
Hvoslef, Jakob .....Minneapolis
Hynes, James .....Minneapolis
Hynes, John E.....Minneapolis

Ide, A. W.....Brainerd
Ikeda, Kano .....Minneapolis
Irvine, H. G.....Minneapolis

Jacobs, A. C.....Elmore
Jacobs, J. C.....Willmar
James, J. H.....Mankato
Jamieson, Earl.....Walnut Grove
Jarvis, Bruce W.....Minneapolis
Jenckes, H. D.....Pipestone
Jensen, J. C.....Hendricks
Jensen, M. J.....Minneapolis
Jensen, T. J.....Duluth

Jesion, J. W.....St. Paul
Johnson, August E.....Minneapolis
Johnson, Asa M.....St. Paul
Johnson, Carl M.....Dawson
Johnson, Chas. H....Spring Valley
Johnson, Christian .....Willmar
Johnson, Einer W.....Bemidji
Johnson, Hans .....Kerkhoven
Johnson, Hartland C.....St. Paul
Johnson, Herman M.....Dawson
Johnson, James A.....Minneapolis
Johnson, Julius .....Minneapolis
Johnson, Nimrod A....Minneapolis
Johnson, Oscar V.....Sebeka
Johnson, R. A.....Minneapolis
Johnson, Theo. H.....St. Paul
Johnston, E. B.....Benson
Jones, A. W.....Red Wing
Jones, D. N.....Minneapolis
Jones, E. M.....St. Paul
Jones, G. M.....Minneapolis
Jones, Herbert W.....Minneapolis
Jones, Richard N.....Minneapolis
Jones, W. A.....Minneapolis
Josewich, Alex.....Minneapolis
Joyce, George .....Rochester
Joyce, T. M.....Janesville
Judd, E. Starr.....Rochester
Judson, W. E.....Duluth
Just, A. A.....Crookston

Kabrick, O. A.....Odin
Kahala, Arthur .....Crookston
Kalinoff, D .....Stillwater
Kamp, Byron A.....Albert Lea
Kannary, E. L.....St. Paul
Kanne, C. W.....Arlington
Karn, B. R.....Ortonville
Kaufman, Wm. C.....Appleton
Kelly, B. W.....Aitkin
Kelly, John V.....St. Paul
Kelly, Paul H.....St. Paul
Kelly, T. C.....Mankato
Kemp, A. F.....Mankato
Kendrick, Wm. N....Spring Valley
Kennedy, C. C.....Minneapolis
Kennedy, R. R.....Minneapolis
Kenyon, Paul E.....Wadena
Kern, M. J..... St. Cloud
Kerrick, Stanley E....Minneapolis
Kesting, Herman.....St. Paul
Keyes, C. R.....Duluth
Keyes, E. D.....Winona
Kibbe, O. A.....Canton
Kierland, P. E.....Harmony
Kiesling, I. H.....Chisholm
Kilbourne, A. F.....Rochester
Kilbride, J. S.....Canby
Kimball, H. H.....Minneapolis
King, W. R.....Minneapolis
Kirk, G. P.....E. Grand Forks
Kirmse, Geo. W.....Minneapolis
Kirsch, Ralph L.....Crookston
Kistler, C. M.....Minneapolis
Kittleson, John A.....Lowry
Kjelland, J. S.....Crookston
Klein, Harry .....Duluth
Klein, H. N.....St. Paul
Knauff, M. K.....St. Paul
Knickerbocker, Frank H....Staples
Knight, H. L.....Minneapolis
Knight, R. R.....Minneapolis
Knight, Ralph T.....Minneapolis
Knight, S. G.....Randall
Knights, F. A.....Pequot
Knudtson, H. M.....Pipestone
Koch, John C.....Minneapolis
Kohler, Geo. A.....Minneapolis
Kvitrud, Gilbert.....St. Paul
Kollen, H. M.....Minneapolis
Koller, L. R.....Minneapolis
Kolset, Carl D.....Benson
Kraft, Peter .....Duluth
Kremer, Walter J.....Minneapolis
Kriedt, Daniel .....Minneapolis
Kuhlmann, August .....Melrose
Kuth, Jos. R.....Duluth

Laird, A. T.....Nopeming
Lajoie, J. M.....Minneapolis
Lamb, Harold L.....Sauk Center
Lande, Wm. B.....St. Paul
Landenberger, John...New Prague
Landeen, F. J.....Stillwater
Lane, Laura A.....Faribault
Laney, R. L.....Deer River
Langenderfer, F. V.....St. Paul
Lannin, J. C.....Mabel
Lapierre, C. A.....Minneapolis
Larsen, C. L.....St. Paul
Larsen, O. O.....Detroit
Laughlin, J. T.....Gray Eagle
Laurent, A. A.....Minneapolis
LaVake, R. T.....Minneapolis
Law, A. A.....Minneapolis
Leach, W. D.....Callaway
Leahy, Bartholmew.....St. Paul
Leavitt, H. H.....Minneapolis
Leck, Clifford E.....Austin
LeClerc, Jos. E.....Le Sueur
Lee, Thos. G.....Minneapolis
Lee, W. N.....Madison
Lee, W. P.....Northfield
Leicht, Oswald .....Winona
Leitch, Arch. .....St. Paul
Leland, J. T.....Herman
Leland, M. N.....Minneapolis
Lemon, W. S.....Rochester
Lemstrom, Jarl .....Minneapolis
Lenont, C. B.....Virginia
Lepak, John A.....St. Paul
Lerche, William.....St. Paul
Lester, C. A.....Winona
Leuty, Amos .....Morris
Lewis, C. B.....St. Cloud
Lewis, C. F.....Austin
Lewis, Edwin J.....Sauk Center
Lewis, J. B.....South St. Paul
Lewis, J. D.....Minneapolis
Lewis, W. W.....St. Paul
Lexa, F. J.....Lonsdale
Libert, John.....St. Cloud
Lichtenstein, H. M.....Winona
Liedloff, A. G.....Mankato
Lillie, H. I.....Rochester
Lima, Ludwig .....Montevideo
Lind, C. J.....Minneapolis
Linde, Herman .....Cyrus
Lindgren, E. I.....Duluth
Lindsay, W. V.....Winona
Linnerman, N. L.....Duluth
Linner, H. P.....Minneapolis
Linton, W. B.....Rochester
Lisar, G. M.....St. James
Little, J. W.....Minneapolis
Little, W. J.....St. Paul
Litzenberg, J. C.....Minneapolis
Lloyd, H. J.....Mankato
Logan, A. H.....Rochester
Logan, F. W.....Blue Earth
Lommen, A. P.....Lanesboro
Loomis, E. A.....Minneapolis
Love, Geo. A.....Preston
Lowe, L. M.....Glyndon
Lowe, Thomas .....Pipestone
Luedtke, G. H.....Fairmont
Lufkin, H. M.....St. Paul
Lum, C. E.....Duluth
Lund, S. O.....Montevideo
Lynam, Frank .....Duluth
Lynch, J. L.....Winona
Lyng, John A.....Minneapolis
Lynn, J. F.....Waseca
Lyon, H. R.....Rochester
Lyon, J. D.....Minneapolis
Lysne, Henry .....Minneapolis

McCann, D. F.....Bemidji
McCarthy, W. J.....Madelia
McCarthy, W. R.....St. Paul
McClanahan, J. H.....White Bear
McCloud, C. N.....St. Paul
McComb, C. F.....Duluth
McCoy, Mary K.....Duluth
McCrea, James .....Fulda
McCreight, Geo.....Albert Lea
McCuen, J. A.....Duluth
McDavitt, Thos.....St. Paul
McDonald, A. L.....Duluth
McDonald, H. N.....Minneapolis
McDougald, D. W.....Le Sueur
McDowell, J. P.....St. Cloud
McEachran, A. .....Minneapolis
McGiffert, E. N.....Duluth
McGroarty, J. J.....Easton
McHugh, R F.....Aitkin
McIntire, H. M.....Eveleth
McIntyre, E. H.....Virginia
McIntyre, Geo. .....Minneapolis
McIntyre, G. W.....St. Peter
McIntyre, John A.....Round Lake
McKeown, E. G.....Pipestone
McKibbon, H. E.....St. Cloud
McKinnon, J. J.....Wadena
McLaren, Jenetta M.....St. Paul
McLaughlin, E. M.....Winona
McNevin, C. F.....St. Paul
MacDonald, D. A.....Minneapolis
MacDonald, I. C.....Minneapolis
MacLaren, Archibald.....St. Paul
Macnie, J. S.....Minneapolis
Maercklein, Ivan R.....Renville
Maertz, Wm. F.....New Prague
Magney, F. H.....Duluth
Magnusson, Herman V.—
North Branch
Maitland, David P.....Jackson
Maland, C. O.....Minneapolis
Malmgren, C. V.....Virginia
Maloney, T. J.....St. Paul
Manley, J. R.....Duluth
Mann, A. T.....Minneapolis
Manson, F. M.....Worthington
Marcum, E. H.....Bemidji
Mariette, E. S.....Hopkins
Mark, A. E.....Rochester
Mark, D. B.....Minneapolis
Martin, T. R.....Duluth
Masson, Jas. C.....Rochester
Mattick, W. S.....Deerwood
Maurer, E. L.....Brownton
May, C. C.....Adrian
May, W. H.....Minneapolis
Mayland, M. L.....Faribault
Mayo, C. H.....Rochester
Mayo, W. J.....Rochester
Mead, Marion A.....Minneapolis
Meierding, W. A.....Springfield
Meighen, J. W.....Ulen
Melby, Benedik...Blooming Prairie
Mellby, O. F.....Thief River Falls
Melson, O. C.....Rochester
Melzer, G. R.....Lyle
Merrill, B. J.....Stillwater
Merrill, J. E.....Amboy
Merriman, L. L.....Duluth
Merritt, Geo. F.....St. Peter
Mesker, G. H.....Olivia
Metcalf, F. W.....Winton
Metcalf, J. M.....Monticello
Meyer, E. L.....Minneapolis
Meyerding, E. A.....St. Paul
Meyerding, Henry W.....Rochester
Miller, Victor I.....Mankato
Miller, W. A.....New York Mills
Millspaugh, J. G.....Little Falls
Mingo, F. E.....Hugo
Mitchell, R. S.....Grand Meadow
Moffatt, A. G.....Howard Lake
Mogilner, L. M.....St. Paul
Moir, W. W.....Minneapolis
Molander, H. A.....St. Paul
Moloney, G. P.....New Prague
Molzahn, H. E.....St. Paul
Monahan, J. A.....Minneapolis
Monahan, Robert .....Minneapolis
Moore, A. B.....Rochester
Moore, W. J.....Adams
Moorehead, Martha B..Minneapolis
Morehouse, G. G.....Owatonna
Moren, E .....Minneapolis
Mork, B. O.....Worthington
Morley, G. A.....Crookston
Morrison, A. W.....Minneapolis
Morriss, Herbert A.....Minneapolis
Morrissey, F. B.....St. Paul
Morse, M. P.....Le Roy
Morse, W. E. H.....Morristown
Morsman, L. M.....Hibbing
Mortensen, N. G.....St. Paul
Mosse, F. R.....Rochester
Moynihan, A. F.....Sauk Center
Moynihan, T. J.....St. Paul
Muehlig, G. F.....Rochester
Murdock, H. G.....Taylor Falls
Murphy, E. F.....St. Paul
Murphy, Ignatius J....Minneapolis
Murray, D. D.....Duluth
Murray, Wm. R.....Minneapolis
Mussey, R. D.....Rochester
Myers, Thos.....St. Paul

Nannestad, J. R.....Albert Lea
Nass, H. A.....Mabel
Nauth, W. W.....Winona
Neher, F. H.....St. Paul
Nelson, C. P.....Minneapolis
Nelson, H. E.....Crookston
Nelson, H. S.....Minneapolis
Nelson, L. A.....St. Paul
Nelson, M. S.....Spring Grove
Nelson, N. A.....Dawson
Neuman, G. A.....Stillwater
Neumann, C. A.....Lewiston
Neumann, W. H.....Lewiston

New, G. B.....Rochester
Newhart, Horace .....Minneapolis
Nicholson, Jos. .....Brainerd
Nicholson, M. A.....Duluth
Nippert, H. T.....St. Paul
Nippert, L. A.....Minneapolis
Nissen, Henrik .....Minneapolis
Nordin, C. G.....Brainerd
Noonan, D. F.....Minneapolis
Nordland, Martin .....Robbinsdale
Nordley, H. R.....Minneapolis
Norman, J. F.....Crookston
Noth, H. W.....Minneapolis
Novak, E. E.....New Prague
Nye, Katherine A.....St. Paul

O'Brien, H. J.....St. Paul
O'Connor, D. C.....Eden Valley
O'Donnell, D. M.....Ortonville
O'Donnell, J. E.....Minneapolis
O'Hara, J. J.....Janesville
Oberg, C. M.....Minneapolis
Oerting, Harry.....St. Paul
Ogden, B. H.....St. Paul
Ohage, Justus .....St. Paul
Ohage, Justus Jr.....St. Paul
Ohlinger, L. B.....Rochester
Oliver, C. I.....Graceville
Olson, C. A.....St. Paul
Olson, F. A.....Minneapolis
Olson, G. M.....Minneapolis
Olson, Olof A.....Minneapolis
Olson, O. H.....Erskine
Olson, R. G.....Nicollet
Oppegard, M. O.....Minneapolis
Osborn, Lida .....Mankato
Ostergren, E. W.....St. Paul
Osburn, B. F....International Falls
Onsgard, C. K.....Rushford
Onsgard, L. K.....Houston
Owre, Oscar .....Minneapolis

Palmer, W. L.....Albert Lea
Paradine, D. J.....Duluth
Parker, E. H.....Minneapolis
Parks, Albert H.....Minneapolis
Parr, L. T.....Duluth
Parrott, B. W.....Long Prairie
Parsons, George E.....Elk River
Passer, A. A.....Olivia
Patterson, W. E.....Minneapolis
Patterson, W. E.....Currie
Paulson, A. J.....Thief River Falls
Paulsen, E. L.....Minneapolis
Payette, C. H.....Duluth
Peck, L. D.....Hastings
Pederson, R. M.....Minneapolis
Pierson, Homer F.....Austin
Pemberton, J. deJ.....Rochester
Pengelly, E. J.....Ironton
Penhall, F. W.....Morton
Pennie, D. F.....Duluth
Peppard, Thos. A.....Minneapolis
Perry, C. G.....St. Paul
Perry, Ralph St. J.....Minneapolis
Persons, C. E.....Marshall
Peterson, A. C.....Dassel
Peterson, Christian .....Owatonna
Peterson, Henry E...Granite Falls
Peterson, J. R.....Minneapolis
Peterson, Thorwald....Minneapolis
Pettit, C. W.....Minneapolis
Phelps, R. M.....St. Peter
Phillips, A. E.....Delano
Phillips, J. G.....Northfield
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